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STRUCTURE FILE UPDATES:   29 APR 2007  HIGHEST RN 933681-85-7
DICTIONARY FILE UPDATES:  29 APR 2007  HIGHEST RN 933681-85-7

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=> d his nofile

     (FILE 'HOME' ENTERED AT 13:42:52 ON 30 APR 2007)

     FILE 'HCAPLUS' ENTERED AT 13:43:01 ON 30 APR 2007
L1             1 SEA ABB=ON  PLU=ON  US2004137330/PN

     FILE 'REGISTRY' ENTERED AT 13:44:03 ON 30 APR 2007
L2             7 SEA ABB=ON  PLU=ON  (10377-52-3/BI OR 150499-39-1/BI OR
                 7439-93-2/BI OR 7440-01-9/BI OR 7440-37-1/BI OR 7440-59-7
                 /BI OR 7704-34-9/BI)
                 D SCA
L3             1 SEA ABB=ON  PLU=ON  7439-93-2/RN
L4          9735 SEA ABB=ON  PLU=ON  (LI(L)P(L)O)/ELS
L5            20 SEA ABB=ON  PLU=ON  L4 (L) 3/ELC.SUB
L6          7146 SEA ABB=ON  PLU=ON  L4(L)H/ELS
L7           105 SEA ABB=ON  PLU=ON  L6(L)4/ELC.SUB
L8          3387 SEA ABB=ON  PLU=ON  L4 (L) N/ELS
L9            69 SEA ABB=ON  PLU=ON  L8 (L) 4/ELC.SUB

     FILE 'HCAPLUS' ENTERED AT 15:07:11 ON 30 APR 2007
L10         4878 SEA ABB=ON  PLU=ON  L3(L)METAL?
L11               QUE ABB=ON  PLU=ON  (LITHIUM OR LI)(3A)METAL?
L12               QUE ABB=ON  PLU=ON  LAYER? OR OVERLAY?
L13               QUE ABB=ON  PLU=ON  PRETREAT? OR PRE(W)TREAT?
L14          773 SEA ABB=ON  PLU=ON  L13(3A)L12
L15               QUE ABB=ON  PLU=ON  THICK?
L16        97288 SEA ABB=ON  PLU=ON  L15(3A)(10 OR 20 OR 30 OR 40 OR 50
                 OR 60 OR 4000 OR 5000 OR 6000)
L17               QUE ABB=ON  PLU=ON  CONDUCT?
L18        28790 SEA ABB=ON  PLU=ON  L17(3A)(5 OR 10 OR 15)
L19               QUE ABB=ON  PLU=ON  PROTECT?(3A)L12
L20            2 SEA ABB=ON  PLU=ON  (L10 OR L11) AND L14
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L21        2018 SEA ABB=ON  PLU=ON  (L10 OR L11) AND L12
L22        2011 SEA ABB=ON  PLU=ON  L5 OR L7
L23         180 SEA ABB=ON  PLU=ON  L9
L24         382 SEA ABB=ON  PLU=ON  L21 AND (L17 OR L22)
L25          33 SEA ABB=ON  PLU=ON  L24 AND (L19 OR L23)
L26           2 SEA ABB=ON  PLU=ON  L25 AND L16
L27           2 SEA ABB=ON  PLU=ON  L25 AND L18
L28           4 SEA ABB=ON  PLU=ON  L20 OR L26 OR L27
L29          30 SEA ABB=ON  PLU=ON  L25 NOT L28
L30          23 SEA ABB=ON  PLU=ON  L29 AND (1907-2002)/PY,PRY,AY

=> fil hcap
FILE 'HCAPLUS' ENTERED AT 15:31:42 ON 30 APR 2007
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FILE COVERS 1907 - 30 Apr 2007  VOL 146 ISS 19
FILE LAST UPDATED: 29 Apr 2007  (20070429/ED)

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 This file contains CAS Registry Numbers for easy and accurate
 substance identification.

=> d l28 ibib abs hitstr hitind 1-4

L28  ANSWER 1 OF 4  HCAPLUS  COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER:         2006:269693  HCAPLUS  Full-text
DOCUMENT NUMBER:          144:295967
TITLE:                    Metal-air battery with ion-conducting
                          inorganic glass electrolyte
INVENTOR(S):              Jang, Bor Z.
PATENT ASSIGNEE(S):       USA
SOURCE:                   U.S. Pat. Appl. Publ., 9 pp.
                          CODEN: USXXCO
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.           KIND   DATE        APPLICATION NO.        DATE
     ---------------      ----   --------    --------------------
     --------
     US 2006063051         A1    20060323    US 2004-944667
                                                                   200409
                                                                   20
PRIORITY APPLN. INFO.:                       US 2004-944667
```

200409
20

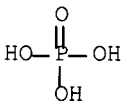
AB The invention concerns a solid-state metal-air electrochem. cell comprising: (a) a metal-containing electroactive anode; (b) an oxygen electroactive cathode; and (c) an ion-**conducting** glass electrolyte disposed between the metal-containing anode and the oxygen electroactive cathode. The cathode active material, which is oxygen gas, is not stored in the battery but rather fed from the environment. The oxygen cathode is preferably a composite carbon electrode which serves as the cathode current collector on which oxygen mols. are reduced during discharge of the battery to generate elec. current. The glass electrolyte typically has an ion **conductivity** in the range of 5+10-5 to 2+10-3 S/cm. The electrolyte **layer** is preferably smaller than **10** μm in **thickness** and further preferably smaller than 1 μm. The anode **metal** is preferably **lithium** or lithium alloy, but may be selected from other elements such as sodium, magnesium, calcium, aluminum and zinc.

IT **7439-93-2, Lithium**, uses **10377-52-3, Lithium** phosphate **184905-46-2, Lithium** nitrogen phosphorus oxide
RL: DEV (Device component use); USES (Uses)
(**metal**-air battery with ion-**conducting** inorg. glass electrolyte)

RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

Li

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



3 Li

RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

INCL 429029000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57
ST battery ion **conducting** inorg glass electrolyte
IT Alloys, uses
RL: DEV (Device component use); USES (Uses)

(alkaline earth; metal-air battery with ion-**conducting** inorg. glass electrolyte)

IT Alkaline earth metals
RL: DEV (Device component use); USES (Uses)
(alloys; metal-air battery with ion-**conducting** inorg. glass electrolyte)

IT Vapor deposition process
(chemical; metal-air battery with ion-**conducting** inorg. glass electrolyte)

IT Glass, uses
RL: DEV (Device component use); USES (Uses)
(electrolyte; metal-air battery with ion-**conducting** inorg. glass electrolyte)

IT Borate glasses
RL: DEV (Device component use); USES (Uses)
(**lithium** borate; **metal**-air battery with ion-**conducting** inorg. glass electrolyte)

IT Phosphate glasses
RL: DEV (Device component use); USES (Uses)
(**lithium** phosphate; **metal**-air battery with ion-**conducting** inorg. glass electrolyte)

IT Silicate glasses
RL: DEV (Device component use); USES (Uses)
(**lithium** silicate; **metal**-air battery with ion-**conducting** inorg. glass electrolyte)

IT Glass, uses
RL: DEV (Device component use); USES (Uses)
(**lithium** silicon borate sulfide; **metal**-air battery with ion-**conducting** inorg. glass electrolyte)

IT Glass, uses
RL: DEV (Device component use); USES (Uses)
(lithium silicon oxide phosphate sulfide; metal-air battery with ion-**conducting** inorg. glass electrolyte)

IT Glass, uses
RL: DEV (Device component use); USES (Uses)
(**lithium** silicon phosphate sulfide; **metal**-air battery with ion-**conducting** inorg. glass electrolyte)

IT Glass, uses
RL: DEV (Device component use); USES (Uses)
(**lithium** silicon silicate sulfide; **metal**-air battery with ion-**conducting** inorg. glass electrolyte)

IT Battery electrolytes
Ionic **conductivity**
Laser ablation
Primary batteries
Sputtering
(metal-air battery with ion-**conducting** inorg. glass electrolyte)

IT Alkaline earth metals
Carbonaceous materials (technological products)
RL: DEV (Device component use); USES (Uses)
(metal-air battery with ion-**conducting** inorg. glass electrolyte)

IT Vapor deposition process
(phys.; metal-air battery with ion-**conducting** inorg. glass electrolyte)

IT Vapor deposition process
(plasma; metal-air battery with ion-**conducting** inorg. glass electrolyte)

IT Evaporation

(vacuum; metal-air battery with ion-**conducting** inorg. glass electrolyte)

IT **Lithium** alloy, base
RL: DEV (Device component use); USES (Uses)
(**metal**-air battery with ion-**conducting** inorg. glass electrolyte)

IT 12136-58-2, **Lithium** sulfide (Li2S) 13759-10-9, Silicon sulfide (SiS2)
RL: DEV (Device component use); USES (Uses)
(glass; **metal**-air battery with ion-**conducting** inorg. glass electrolyte)

IT 3277-26-7, 1,1,3,3-Tetramethyldisiloxane
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(metal-air battery with ion-**conducting** inorg. glass electrolyte)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses **7439-93-2**, **Lithium**, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7440-02-0, Nickel, uses 7440-09-7, Potassium, uses 7440-17-7, Rubidium, uses 7440-23-5, Sodium, uses 7440-24-6, Strontium, uses 7440-32-6, Titanium, uses 7440-39-3, Barium, uses 7440-41-7, Beryllium, uses 7440-44-0, Carbon, uses 7440-46-2, Cesium, uses 7440-47-3, Chromium, uses 7440-66-6, Zinc, uses 7440-70-2, Calcium, uses **10377-52-3**, **Lithium** phosphate 11102-77-5 12627-14-4, **Lithium** silicate 12676-27-6 12798-95-7 37186-88-2 37220-89-6, **Lithium** aluminate 39300-27-1 53680-59-4 65777-94-8 **184905-46-2**, **Lithium** nitrogen phosphorus oxide 236388-73-1, **Lithium** silicide sulfide 236388-75-3, Aluminum **lithium** sulfide 236388-76-4, **Lithium** phosphide sulfide
RL: DEV (Device component use); USES (Uses)
(**metal**-air battery with ion-**conducting** inorg. glass electrolyte)

IT 178958-56-0P, **Lithium** silicon oxide
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(**metal**-air battery with ion-**conducting** inorg. glass electrolyte)

L28 ANSWER 2 OF 4 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:878025 HCAPLUS Full-text
DOCUMENT NUMBER: 141:368410
TITLE: Method of preparation of anode for lithium battery
INVENTOR(S): Lee, Jong-Ki; Lee, Jea-Woan; Cho, Chung-Kun; Lee, Sang-Mock
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: U.S. Pat. Appl. Publ., 8 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004209159	A1	20041021	US 2004-820762	200404

KR 2004090561	A	20041026	KR 2003-24427	20030409
JP 2004319489	A	20041111	JP 2004-116658	20040412
CN 1571187	A	20050126	CN 2004-10071491	20040417

PRIORITY APPLN. INFO.: KR 2003-24427 A 20030417

AB A neg. electrode of a lithium battery includes a **lithium metal** and a **protective layer** that includes a material having an ion **conductivity** of at least **5**.times.10-5 S/cm. The **protective layer** includes ion **conductive** material that has a dense internal structure and an effective adhesive strength to the **lithium metal**. Although the **protective layer** has a thickness in the order of micrometers, the **protective layer** does not cause resistance to the electrochem. reaction and is chemical stable with respect to both the **lithium metal** and the electrolyte.

IC ICM H01M002-16
ICS H01M004-40; B05D005-12

INCL 429137000; X42-924.6; X42-923.195; X42-712.3

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Battery anodes
Electron beam evaporation
Ion beam sputtering
Ionic **conductivity**
Laser ablation
Sputtering
(method of preparation of anode for lithium battery)

IT Nitrides
Oxides (inorganic), uses
Oxynitrides
Sulfides, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**protective layer**; method of preparation of anode for lithium battery)

IT 12015-64-4, Lithium chloride nitride (Li9Cl3N2) 14024-11-4, Lithium tetrachloroaluminate 26134-62-3, Lithium nitride (Li3N) 73071-42-8, Lithium iodide nitride (Li10IN3) 778589-21-2, Lithium sodium chloride nitride ((Li,Na)9Cl3N2) 778589-22-3, Lithium potassium chloride nitride ((Li,K)9Cl3N2) 778589-23-4, Lithium rubidium chloride nitride ((Li,Rb)9Cl3N2) 778589-24-5, Cesium lithium chloride nitride ((Cs,Li)9Cl3N2) 778589-25-6, Lithium sodium iodide nitride (Li9NaIN3) 778589-26-7, Lithium potassium iodide nitride (Li9KIN3) 778589-27-8, Lithium rubidium iodide nitride (Li9RbIN3)
RL: TEM (Technical or engineered material use); USES (Uses)
(**protective layer**; method of preparation of anode for lithium battery)

L28 ANSWER 3 OF 4 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:391728 HCAPLUS Full-text
DOCUMENT NUMBER: 140:378090
TITLE: Anodes for lithium-sulfur batteries, their manufacture, and lithium-sulfur batteries using them

INVENTOR(S): Lee, Jong Ki; Lee, Je Won; Cho, Joung Keun; Lee, Sang Muk; Kim, Min Hyup
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

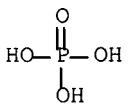
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004139968	A	20040513	JP 2003-276606	200307 18
KR 2004035100	A	20040429	KR 2002-63834	200210 18
US 2004137330	A1	20040715	US 2003-688781	200310 17
CN 1508893	A	20040630	CN 2003-10123734	200310 18

PRIORITY APPLN. INFO.: KR 2002-63834 A 200210 18

AB The anodes for lithium-sulfur batteries are manufactured by forming a **pretreatment layer** (**thickness 50** -**5000** Å) containing Li+-**conductive** substances having ionic **conductivity** ≥1 + **10**-10 S/cm on **Li metal** by vapor deposition under inert gas atmospheric and forming a **Li metal**-protective film by vapor deposition. Preferably, the Li+-**conductive** substance may be Li3PO4 and the **protective layer** contains Li2.9PO3.3N0.46. Lithium-sulfur batteries contain the anodes above and cathodes containing cathode active materials selected from S element, S-series compds., and their mixts. The anode **pretreatment layer** shows high ionic **cond** . and no volume expansion.

IT **7439-93-2**, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(manufacture of lithium-sulfur battery anodes having Li+-**conductive pretreatment layer** and **Li metal-protective layer**)
RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

IT **10377-52-3**, Lithium phosphate
RL: DEV (Device component use); USES (Uses)
(**pretreatment layer**; manufacture of lithium-sulfur battery anodes having Li+-**conductive pretreatment layer** and **Li metal-protective layer**)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



IT **150499-39-1**, Lithium metaphosphate nitride oxide (Li2.9(PO3)N0.46O0.3)
RL: DEV (Device component use); USES (Uses)
(**protective layer**; manufacture of lithium-sulfur battery anodes having Li+-**conductive pretreatment layer** and **Li metal-protective layer**)
RN 150499-39-1 HCAPLUS
CN Lithium metaphosphate nitride oxide (Li2.9(PO3)N0.46O0.3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.46	17778-88-0
O	0.3	17778-80-2
O3P	1	15389-19-2
Li	2.9	7439-93-2

IC ICM H01M004-02
ICS H01M004-04; H01M004-40; H01M004-62; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72
IT Controlled atmospheres
(inert, in vapor deposition; manufacture of lithium-sulfur battery anodes having Li+-**conductive pretreatment layer** and **Li metal-protective layer**)
IT Secondary batteries
(lithium-sulfur; manufacture of lithium-sulfur battery anodes having Li+-**conductive pretreatment layer** and **Li metal-protective layer**)
IT Battery anodes
Battery cathodes
Ionic **conductors**
Vapor deposition process
(manufacture of lithium-sulfur battery anodes having Li+-**conductive pretreatment layer** and **Li metal-protective layer**)
IT 7704-34-9, Sulfur, uses
RL: DEV (Device component use); USES (Uses)
(cathode; manufacture of lithium-sulfur battery anodes having Li+-**conductive pretreatment layer** and **Li metal-protective layer**)
IT 7440-01-9, Neon, uses 7440-37-1, Argon, uses 7440-59-7, Helium, uses
RL: NUU (Other use, unclassified); USES (Uses)
(inert atmospheric in vapor deposition; manufacture of lithium-sulfur battery

anodes having Li+-**conductive pretreatment layer** and **Li metal-protective layer**)

IT **7439-93-2**, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(manufacture of lithium-sulfur battery anodes having Li+-**conductive pretreatment layer** and **Li metal-protective layer**)

IT **10377-52-3**, Lithium phosphate
RL: DEV (Device component use); USES (Uses)
(**pretreatment layer**; manufacture of lithium-sulfur battery anodes having Li+-**conductive pretreatment layer** and **Li metal-protective layer**)

IT **150499-39-1**, Lithium metaphosphate nitride oxide (Li2.9(PO3)N0.46O0.3)
RL: DEV (Device component use); USES (Uses)
(**protective layer**; manufacture of lithium-sulfur battery anodes having Li+-**conductive pretreatment layer** and **Li metal-protective layer**)

L28 ANSWER 4 OF 4 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1998:696839 HCAPLUS Full-text
DOCUMENT NUMBER: 129:345405
TITLE: Systems and method for secondary lithium battery manufacture
INVENTOR(S): Awa, Shoichiro; Inui, Tsuneo
PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan; Fuji Film Celltec K. K.
SOURCE: Jpn. Kokai Tokkyo Koho, 28 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 10289729	A	19981027	JP 1997-99211	199704 16

PRIORITY APPLN. INFO.: JP 1997-99211 199704 16

AB The systems, for the manufacture of batteries using Li containing oxide cathodes and anodes containing a **Li** based **metal** layer on an active mass mixture **layer**, have a ~~pretreatment means, an activation~~ means, and a posttreatment means. Preferably, the pretreatment means is for dissolving homogeneously distributing **Li** in the **metal** component in the battery, the activation means is for intercalating anodes with Li, and the posttreatment means is for completing the activation. The batteries are prepared by successive pretreatment, activation, and posttreatment processes in the system.

IC ICM H01M010-38
ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

=> d l30 ibib abs hitstr hitind 1-23

L30 ANSWER 1 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:689221 HCAPLUS Full-text
DOCUMENT NUMBER: 145:127634
TITLE: Protected lithium anodes for lithium secondary batteries
INVENTOR(S): Cho, Jung Geun; Kim, Min Seok; Lee, Jong Gi; Lee, Sang Mok
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: Repub. Korean Kongkae Taeho Kongbo, No pp. given
CODEN: KRXXA7
DOCUMENT TYPE: Patent
LANGUAGE: Korean
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
KR 2004026370	A	20040331	KR 2002-57814	200209 24 <--

PRIORITY APPLN. INFO.: KR 2002-57814 200209 24 <--

AB This Li anode extends the service life of Li secondary batteries by using 2 **protection layers** separated from each other in the anode, and both of these have some distance from the end of the Li anode. The Li anode comprises: a 1st **protection layer** arranged on the surface of the **Li metal**, wherein the surface is opposite to the side contacting the current collector; and a 2nd **protection layer** arranged inside the Li **layer**. The **protection layers** have Li-ion **conductivity** and are separated from the end of the anode.

IC ICM H01M004-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

L30 ANSWER 2 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:564516 HCAPLUS Full-text
DOCUMENT NUMBER: 143:81150
TITLE: Chemical protection of a lithium surface
INVENTOR(S): De Jonghe, Lutgard; Visco, Steven J.; Nimon, Yevgeniy S.; Sukeshini, A. Mary
PATENT ASSIGNEE(S): Polyplus Battery Co., USA
SOURCE: U.S., 16 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

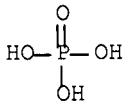
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6911280	B1	20050628	US 2002-327682	200212 20 <--
US 2005186469	A1	20050825	US 2005-92781	

200503
28
<--
PRIORITY APPLN. INFO.: US 2001-342326P P
200112
21
<--
US 2002-327682 A1
200212
20
<--

AB Disclosed are compns. and methods for alleviating the problem of reaction of lithium or other alkali or alkaline earth metals with incompatible processing and operating environments by creating a ionically **conductive** chemical **protective layer** on the **lithium** or other reactive **metal** surface. Such a chemical produced surface **layer** can **protect lithium metal** from reacting with oxygen, nitrogen or moisture in ambient atmospheric thereby allowing the lithium material to be handled outside of a controlled atmospheric, such as a dry room. Production processes involving lithium are thereby very considerably simplified. One example of such a process in the processing of lithium to form neg. electrodes for **lithium metal** batteries.

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: DEV (Device component use); USES (Uses)
(glass; chemical protection of lithium surface)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M002-08
ICS H01M010-04; H01M010-26
INCL 429137000; 429246000; 429231900; 429231950; 429309000; 429319000; 429320000; 429321000; 429322000; 429126100
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 57
IT Battery anodes
Battery electrolytes
Coating materials
Electric **conductors**, glass

Evaporation
Glass ceramics
Polymer electrolytes
(chemical protection of lithium surface)

IT 7440-55-3, Gallium, uses **10377-52-3**, Lithium phosphate 12024-22-5, Gallium sulfide (Ga2S3) 12025-34-2, Germanium sulfide (GeS2) 12136-58-2, Lithium sulfide (Li2S) 13759-10-9, Silicon sulfide (SiS2) **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: DEV (Device component use); USES (Uses)
(glass; chemical protection of lithium surface)

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 3 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:310725 HCAPLUS Full-text
DOCUMENT NUMBER: 140:324230
TITLE: **Lithium metal** anode for **lithium** battery
INVENTOR(S): Cho, Chung-Kun; Lee, Sang-Mock; Lee, Jong-Ki; Kim, Min-Seuk
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: U.S. Pat. Appl. Publ., 5 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004072066	A1	20040415	US 2003-389752 <--	200303 18
KR 2004035909	A	20040430	KR 2002-62256 <--	200210 12
CN 1489229	A	20040414	CN 2003-120528 <--	200303 13
JP 2004134403	A	20040430	JP 2003-349215 <--	200310 08
JP 3787564	B2	20060621		
PRIORITY APPLN. INFO.:			KR 2002-62256 A <--	200210 12

AB Provided is a **lithium metal** anode having a **lithium metal layer** and a porous polymer film integrated with a surface of the **lithium metal layer**. The **lithium metal** anode further includes a current collector attached to the surface of the **lithium metal layer** opposite the porous polymer film. The **lithium metal** anode further includes a **protective** coating **layer** between the porous polymer film and the

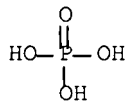
lithium metal layer, the **protective** coating **layer** having lithium ionic **conductivity** and impermeable to an electrolyte.

IT **7439-93-2, Lithium**, uses **7439-93-2D, Lithium**, salt **10377-52-3, Lithium** phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: DEV (Device component use); USES (Uses)
(**lithium metal** anode for **lithium** battery)

RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M002-16
ICS H01M002-18; H01M004-40; H01M010-04
INCL 429137000; 429231950; 429246000; 029623200
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST **lithium metal** anode battery
IT Polyoxyalkylenes, uses
Polysiloxanes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**layer; lithium metal** anode for **lithium** battery)

IT Battery anodes
Coating materials
(**lithium metal** anode for **lithium** battery)
IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**lithium metal** anode for **lithium** battery)
IT Secondary batteries
(**lithium**; **lithium metal** anode for **lithium** battery)
IT Ethers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polycyclic, fluoro-; **lithium metal** anode for **lithium** battery)
IT Energy-rich phosphates
RL: TEM (Technical or engineered material use); USES (Uses)
(polymers; **lithium metal** anode for **lithium** battery)
IT 7440-02-0, Nickel, uses 7440-50-8, Copper, uses
RL: DEV (Device component use); USES (Uses)
(current collector; **lithium metal** anode for **lithium** battery)
IT 9002-88-4, Polyethylene 9003-07-0, Polypropylene
RL: TEM (Technical or engineered material use); USES (Uses)
(film; **lithium metal** anode for **lithium** battery)
IT 25322-68-3, Peo 49717-87-5, 2-Propenoic acid, ion(1-) homopolymer, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**layer**; **lithium metal** anode for **lithium** battery)
IT 110-71-4 111-96-6, Diglyme 126-33-0, Sulfolane 646-06-0, Dioxolane **7439-93-2**, **Lithium**, uses
7439-93-2D, **Lithium**, salt **10377-52-3**, **Lithium** phosphate 12627-14-4, **Lithium** silicate 12676-27-6 26134-62-3, **Lithium** nitride 33454-82-9, **Lithium** triflate 37220-89-6, **Lithium** aluminate 39302-37-9, **Lithium** titanium oxide 152747-89-2, Lanthanum **lithium** oxide **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, **Lithium** silicide sulfide 236388-74-2, **Lithium** boride sulfide 236388-75-3, Aluminum **lithium** sulfide 236388-76-4, **Lithium** phosphide sulfide 342379-43-5, Germanium **lithium** sulfide
RL: DEV (Device component use); USES (Uses)
(**lithium metal** anode for **lithium** battery)
IT 9002-84-0, Ptfe 9011-14-7, Pmma 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 24937-79-9, Pvdf 25014-41-9, Polyacrylonitrile 25067-11-2, Hexafluoropropylene-tetrafluoroethylene copolymer 59947-24-9, Polychlorofluoroethylene
RL: TEM (Technical or engineered material use); USES (Uses)
(**lithium metal** anode for **lithium** battery)

L30 ANSWER 4 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:252055 HCAPLUS Full-text
DOCUMENT NUMBER: 140:256340
TITLE: Anodes for lithium battery

INVENTOR(S): Kim, Yong-tae; Choi, Su-suk; Choi, Yun-suk; Lee, Kyoung-hee
PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea
SOURCE: U.S. Pat. Appl. Publ., 10 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004058232	A1	20040325	US 2003-664157 <--	200309 17
KR 2004026208	A	20040330	KR 2002-57577 <--	200209 23
JP 2004119372	A	20040415	JP 2003-308015 <--	200308 29
CN 1492523	A	20040428	CN 2003-158726 <--	200309 22

PRIORITY APPLN. INFO.: KR 2002-57577 A 200209 23 <--

AB A lithium neg. electrode for a lithium battery has good cycle life and capacity characteristics. The lithium neg. electrode comprises a **lithium metal layer** and a **protective layer** present on the **lithium metal layer**, where the **protective layer** includes an organosulfur compound An organosulfur compound having a thiol terminal group is preferred since such a compound can form a complex with **lithium metal** to enable coating to be carried out easily. The organosulfur compound has a large number of S or N elements having high electronegativity to form a complex with lithium ions, so it renders lithium ions to be deposited relatively evenly on the **lithium metal** surface, reducing dendrite formation.

IC ICM H01M002-16
ICS H01M004-66; H01M004-40
INCL 429137000; 429246000; 429245000; 429212000; 429231950
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
IT Battery anodes
Coating materials
Conducting polymers
(anodes for lithium battery)
IT 7704-34-9D, Sulfur, organosulfur compound
RL: TEM (Technical or engineered material use); USES (Uses)
(**protective layer**; anodes for lithium battery)

L30 ANSWER 5 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:306576 HCAPLUS Full-text
DOCUMENT NUMBER: 139:182767
TITLE: Li3PO4:N/LiCoO2 coatings for thin film batteries

AUTHOR(S): Gross, M. E.; Martin, P. M.; Stewart, D. C.; Johnston, J. W.; Windisch, C. F.; Graff, G. L.; Rissmiller, P. L.; Dudeck, E. L.
CORPORATE SOURCE: Pacific Northwest National Laboratory, Richland, WA, USA
SOURCE: Annual Technical Conference Proceedings - Society of Vacuum Coaters (2002), 45th, 119-124
CODEN: ATCCDI; ISSN: 0731-1699
PUBLISHER: Society of Vacuum Coaters
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Li3PO4:N (LIPON)/Li1.04CoO2 thin film battery structures were deposited up to 2 μm thick were deposited using a 15.2 cm diameter Li2.9PO3.5 pressed powder target for reactive RF magnetron sputtering. Li1.04CoO2 thin films were deposited using a 15.2 cm diameter LiCoO2 pressed powder target. LIPON films were deposited in an ultra pure N2 atmosphere and LiCoO2 films were deposited in an ultra pure atmospheric of Ar + O2. Total chamber pressure during deposition ranged between 5 and 20 mtorr and RF power to the sputtering targets ranged from 100 W to 450 W. Because XPS gave ambiguous compositional results, the films were optimized for a.c. and d.c. **conductivity** Elec. **conductivity** was extremely sensitive to deposition conditions, deposition rate, sputtering gas pressure, and reactive gas partial pressure. AC **conductivity** measurements were made at a frequency of 10 kHz, and were correlated to d.c. **conductivity** measurements. LIPON films had the highest **conductivities** in the 660 nS cm-1 range and the highest a.c. **conductivity** of Li1.04CoO2 films was .apprx.0.24 S cm-1. Earlier work showed the most **conductive** films were deposited at 20 mtorr pressures and target powers of 100 W. This work has scaled up to **conductive** films being deposited at 7.5 mtorr pressures and target powers of 400 W. X-ray diffraction anal. showed that the films were mostly amorphous. Films deposited under these conditions were transparent at visible wavelengths with a refractive index of 1.6. Lower **conductivity** films were brownish in appearance and had less transmission than films with high **conductivity** The rechargeable battery structure consisting of an alumina substrate, gold current collector, 0.5-μm Li1.04CoO2 cathode, 1.2-μm LIPON electrolyte, **Li metal** anode, and a copper current collector are currently under test. Early thin film battery cycle testing was successful, addnl. testing is on-going. Performance results are correlated with film properties and reported. Future work will involve optimization of battery performance on a large scale and scale up of the deposition process to include flexible web processing.

IT **203402-92-0P**, Lithium nitride phosphate
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(LIPON, sputtered **layer**; Li3PO4:N/LiCoO2 coatings for thin film secondary batteries)
RN 203402-92-0 HCAPLUS
CN Lithium nitride phosphate (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O4P	x	14265-44-2
Li	x	7439-93-2

IT **581094-51-1**, Lithium metaphosphate oxide (Li2.9(PO3)O0.5)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(pressed powder target; Li3PO4:N/LiCoO2 coatings for thin film secondary batteries)
RN 581094-51-1 HCAPLUS

CN Lithium metaphosphate oxide (Li2.9(PO3)O0.5) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.5	17778-80-2
O3P	1	15389-19-2
Li	2.9	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57
ST Li3PO4 LiCoO2 coating thin film reactive RF magnetron sputtering; XRD secondary lithium battery electrolyte electrode **cond** SEM voltammetry
IT Battery electrodes
Battery electrolytes
Cyclic voltammetry
Electric **conductivity**
Electric impedance
Secondary batteries
(Li3PO4:N/LiCoO2 coatings for thin film secondary batteries)
IT **203402-92-0P**, Lithium nitride phosphate
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(LIPON, sputtered **layer**; Li3PO4:N/LiCoO2 coatings for thin film secondary batteries)
IT **581094-51-1**, Lithium metaphosphate oxide (Li2.9(PO3)O0.5)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(pressed powder target; Li3PO4:N/LiCoO2 coatings for thin film secondary batteries)
IT 152829-46-4P, Cobalt lithium oxide (CoLi1.04O2)
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(sputtered **layer**, cathode; Li3PO4:N/LiCoO2 coatings for thin film secondary batteries)
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 6 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:925553 HCAPLUS Full-text
DOCUMENT NUMBER: 138:15255
TITLE: Thin solid electrolyte battery
INVENTOR(S): Ito, Shuji; Iwamoto, Kazuya; Ukaji, Masaya; Nanai, Norishige; Matsuda, Hiromu; Mino, Tatsuji; Honda, Kazuyoshi; Takai, Yoriko
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002352850	A	20021206	JP 2001-154955	200105

24
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PRIORITY APPLN. INFO.: JP 2001-154955
200105
24
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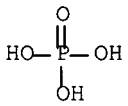
AB The battery has successive **layers** of a 1st collector, a first active mass, an electrolyte, a 2nd active mass and a 2nd collector connected to elec. **conductors**; where the thickness of the 1st active mass **layer** and the electrolyte **layer** is 1-20 and 1-10 μm, resp. Preferably, the collectors are orthogonal to the **conductor**, the electrolyte is (Li2S)x(Si S2)y(Li3PO4)z [(x+y+z)=1, x=0.3-0.8, y=0.2-0.7 and z=0.01-0.3], and the 1st or 2nd active mass is Li3-aMaN (0.2< a< 0.6; M= Co, Ni, Cu and/or Mn).

IT **10377-52-3**, Lithium phosphate (Li3PO4) **477704-33-9**
, Lithium nitride oxide phosphide (Li2.9N0.46O3.3P)
RL: DEV (Device component use); USES (Uses)
(compns. of solid electrolyte for thin secondary lithium batteries)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

RN 477704-33-9 HCAPLUS
CN Lithium nitride oxide phosphide (Li2.9N0.46O3.3P) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.46	17778-88-0
O	3.3	17778-80-2
P	1	7723-14-0
Li	2.9	7439-93-2

IC ICM H01M010-36
ICS H01M010-36; H01M002-26; H01M002-30; H01M004-02; H01M004-58
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST thin battery solid electrolyte **lithium metal** nitride electrode
IT 10377-51-2, Lithium iodide (LiI) **10377-52-3**, Lithium phosphate (Li3PO4) 12136-58-2, Lithium sulfide (Li2S) 13759-10-9, Silicon sulfide (SiS2) 90076-65-6, Lithium bis(trifluoromethanesulfonyl) imide 201471-17-2, Lithium phosphate sulfide thiosilicate (Li1.29(PO4)0.01S0.27(SiS3)0.36) **477704-33-9**, Lithium nitride oxide phosphide (Li2.9N0.46O3.3P)
RL: DEV (Device component use); USES (Uses)
(compns. of solid electrolyte for thin secondary lithium batteries)

L30 ANSWER 7 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:502703 HCAPLUS Full-text
DOCUMENT NUMBER: 137:65723
TITLE: **Layered** arrangements of lithium anodes for batteries
INVENTOR(S): Chu, May-Ying; Visco, Steven J.; Dejonghe, Lutgard C.
PATENT ASSIGNEE(S): Polyplus Battery Company, USA
SOURCE: U.S., 25 pp., Cont.-in-part of U.S. Ser. No. 431,190.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6413285	B1	20020702	US 2000-640467 <--	200008 16
US 6413284	B1	20020702	US 1999-431190 <--	199911 01
CA 2387796	A1	20010510	CA 2000-2387796 <--	200010 27
WO 2001033651	A1	20010510	WO 2000-US29732 <--	200010 27
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1230694	A1	20020814	EP 2000-973968 <--	200010 27
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
BR 2000015111	A	20021126	BR 2000-15111 <--	200010 27
JP 2003529895	T	20031007	JP 2001-535247 <--	200010 27
AU 779944	B2	20050217	AU 2001-12407	200010

27
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WO 2002015301 A2 20020221 WO 2001-US24342
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WO 2002015301 A3 20020926
WO 2002015301 A9 20030403
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,
CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,
LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ,
PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ,
UA, UG, US, UZ, VN, YU, ZA, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AM, AZ, BY,
KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR,
GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI,
CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG
AU 2001081022 A5 20020225 AU 2001-81022
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US 2002034688 A1 20020321 US 2001-999673
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US 6737197 B2 20040518
PRIORITY APPLN. INFO.: US 1999-431190 A2
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US 2000-640467 A
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WO 2000-US29732 W
200010
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WO 2001-US24342 W
200108
02
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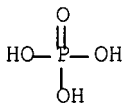
AB A method employing a bonding **layer** is used to form active metal electrodes having barrier **layers**. Active **metals** such as **lithium** are highly reactive in ambient conditions. The method involves fabricating a lithium electrode or other active metal electrode without depositing the barrier **layer** on a **layer** of metal. Rather a smooth barrier **layer** is formed on a smooth substrate such as a web carrier or polymeric electrolyte. A bonding or alloying **layer** is formed on top of the barrier **layer**. Lithium or other active material is then attached to the bonding **layer** to form the active metal electrode. A current collector may also be attached to the **lithium** or active **metal** during the process.

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(glass, barrier **layer**; **layered** arrangements of lithium anodes for batteries)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-04
ICS H01M004-36
INCL 029623400
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST battery lithium anode **layered** arrangement
IT Glass, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(barrier **layer**; **layered** arrangements of lithium anodes for batteries)
IT Vapor deposition process
(chemical; **layered** arrangements of lithium anodes for batteries)
IT Battery anodes
Battery electrolytes
Ionic **conductivity**
(**layered** arrangements of lithium anodes for batteries)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)
IT Polyethers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)
IT Polymer blends
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)
IT Polyphosphazenes
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)
IT Polythioethers
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)
IT Primary batteries
(lithium; **layered** arrangements of lithium anodes for batteries)
IT Vapor deposition process
(phys.; **layered** arrangements of lithium anodes for batteries)
IT Imines

RL: TEM (Technical or engineered material use); USES (Uses)
(polyimines; **layered** arrangements of lithium anodes for batteries)

IT Polymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(releasable web carrier; **layered** arrangements of lithium anodes for batteries)

IT Polyesters, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; **layered** arrangements of lithium anodes for batteries)

IT Aluminum alloy, base
RL: TEM (Technical or engineered material use); USES (Uses)
(foil bonding **layer**; **layered** arrangements of lithium anodes for batteries)

IT Lithium alloy, base
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)

IT 7439-92-1, Lead, uses 7439-93-2, Lithium, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-32-6, Titanium, uses 7440-36-0, Antimony, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(foil bonding **layer**; **layered** arrangements of lithium anodes for batteries)

IT **10377-52-3**, Lithium phosphate 12627-14-4, Lithium silicate 12676-27-6 37220-89-6, Lithium aluminate **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 236388-74-2, Lithium boride sulfide 236388-75-3, Aluminum lithium sulfide 236388-76-4, Lithium phosphide sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(glass, barrier **layer**; **layered** arrangements of lithium anodes for batteries)

IT 12798-95-7
RL: DEV (Device component use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)

IT 12597-68-1, Stainless steel, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7440-31-5, Tin, uses 7440-50-8, Copper, uses 7440-66-6, Zinc, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(releasable web carrier; **layered** arrangements of lithium anodes for batteries)

IT 25038-59-9, Polyethylene terephthalate, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; **layered** arrangements of lithium anodes for batteries)

REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 8 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:143080 HCAPLUS Full-text
DOCUMENT NUMBER: 136:186681
TITLE: **Layered** arrangements of lithium anodes for lithium-sulfur batteries
INVENTOR(S): Chu, May-Ying; Visco, Steven J.; Dejonghe, Lutgard C.
PATENT ASSIGNEE(S): Polyplus Battery Company, USA

SOURCE: PCT Int. Appl., 51 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002015301	A2	20020221	WO 2001-US24342	200108 02
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WO 2002015301	A3	20020926		
WO 2002015301	A9	20030403		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
US 6413285	B1	20020702	US 2000-640467	200008 16
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AU 2001081022	A5	20020225	AU 2001-81022	200108 02
			<--	

PRIORITY APPLN. INFO.:			
	US 2000-640467	A	200008 16
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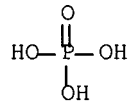
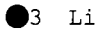
	US 1999-431190	A2	199911 01
	<--		
	WO 2001-US24342	W	200108 02
	<--		

AB A method employing a bonding **layer** is used to form active metal electrodes having barrier **layers**. Active **metals** such as **lithium** are highly reactive in ambient conditions. The method involves fabricating a lithium electrode or other active metal electrode without depositing the barrier **layer** on a **layer** of metal. Rather a smooth barrier **layer** is formed on a smooth substrate such as a web carrier or polymeric electrolyte. A bonding or alloying **layer** is formed on top of the barrier **layer**. Lithium or other active material is then attached to the bonding **layer** to form the active metal electrode. A current collector may also be attached to the **lithium** or active **metal** during the process.

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(releasable web carrier **layer; layered** arrangements of lithium anodes for lithium-sulfur batteries)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)





RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium sulfur battery anode **layered** arrangement
IT Vapor deposition process
(chemical; **layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Battery anodes
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Polyethers, uses
Polymer blends
Polyoxyalkylenes, uses
Polyphosphazenes
Polythioethers
RL: DEV (Device component use); USES (Uses)
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Polyesters, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Sulfide glasses
RL: TEM (Technical or engineered material use); USES (Uses)
(lithium borosulfide, releasable web carrier **layer**; **layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Sulfide glasses
RL: TEM (Technical or engineered material use); USES (Uses)
(lithium silicon sulfide, releasable web carrier **layer**; **layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Primary batteries
(lithium; **layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Vapor deposition process

(phys.; **layered** arrangements of lithium anodes for lithium-sulfur batteries)

IT Imines
RL: DEV (Device component use); USES (Uses)
(polyimines; **layered** arrangements of lithium anodes for lithium-sulfur batteries)

IT Glass, uses
Polymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(releasable web carrier **layer**; **layered** arrangements of lithium anodes for lithium-sulfur batteries)

IT Aluminum alloy, base
Titanium alloy, base
RL: TEM (Technical or engineered material use); USES (Uses)
(foil bonding **layer**; **layered** arrangements of lithium anodes for lithium-sulfur batteries)

IT Lithium alloy, base
RL: DEV (Device component use); USES (Uses)
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)

IT 7439-96-5, Manganese, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-36-0, Antimony, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(foil bonding **layer**; **layered** arrangements of lithium anodes for lithium-sulfur batteries)

IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)

IT 12798-95-7
RL: DEV (Device component use); FMU (Formation, unclassified); FORM (Formation, nonpreparative); USES (Uses)
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)

IT 25038-59-9, Polyethylene terephthalate, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7440-31-5, Tin, uses 7440-50-8, Copper, uses 7440-66-6, Zinc, uses **10377-52-3**, Lithium phosphate 12627-14-4, Lithium silicate 12676-27-6 37220-89-6, Lithium aluminate **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-75-3, Aluminum lithium sulfide 236388-76-4, Lithium phosphide sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(releasable web carrier **layer**; **layered** arrangements of lithium anodes for lithium-sulfur batteries)

L30 ANSWER 9 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:90544 HCAPLUS Full-text
DOCUMENT NUMBER: 136:137424
TITLE: Fabrication of lithium anodes and batteries
INVENTOR(S): Skotheim, Terje A.; Sheehan, Christopher J.; Mikhaylik, Yuriy V.; Affinito, John
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 22 pp., Cont.-in-part of U.S. Ser. No. 721,578.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English

FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2002012846	A1	20020131	US 2001-864890	200105 23
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US 6733924	B1	20040511	US 2000-721519	200011 21
			<--	
US 6797428	B1	20040928	US 2000-721578	200011 21
			<--	
CN 1728418	A	20060201	CN 2005-10079023	200011 21
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WO 2002095849	A2	20021128	WO 2002-US16649	200205 23
			<--	
WO 2002095849	A3	20031204		
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RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2002312067	A1	20021203	AU 2002-312067	200205 23
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EP 1407505	A2	20040414	EP 2002-739419	200205 23
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EP 1407505	B1	20050803		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
CN 1511351	A	20040707	CN 2002-810473	200205 23
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JP 2004527888	T	20040909	JP 2002-592213	200205 23
			<--	
US 2005008935	A1	20050113	US 2004-913839	200408 06
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US 6936381	B2	20050830		
US 2006222954	A1	20061005	US 2006-452445	200606 13 <--
PRIORITY APPLN. INFO.:			US 1999-167171P	P 199911 23 <--
			US 2000-721519	A2 200011 21 <--
			US 2000-721578	A2 200011 21 <--
			CN 2000-818169	A3 200011 21 <--
			US 2001-864890	A 200105 23 <--
			WO 2002-US16649	W 200205 23 <--

AB Provided is an anode for use in electrochem. cells, wherein the anode active **layer** has a first **layer** comprising **lithium metal** and a multi-**layer** structure comprising single ion **conducting layers** and polymer **layers** in contact with the first **layer** comprising **lithium metal** or in contact with an intermediate **protective layer**, such as a temporary **protective** metal **layer**, on the surface of the lithium-containing first **layer**. Another aspect of the invention provides an anode active **layer** formed by the in-situ deposition of lithium vapor and a reactive gas. The anodes of the current invention are particularly useful in electrochem. cells comprising sulfur-containing cathode active materials, such as elemental sulfur.

IT **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: DEV (Device component use); USES (Uses)
(fabrication of lithium anodes and batteries)

RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-40
ICS H01M004-66; B05D005-12
INCL 429231950
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 110-71-4 646-06-0, 1,3-Dioxolane 1344-28-1, Dispal 11N7-12, uses 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses 12031-63-9, Lithium niobium oxide (LiNbO3) 12769-51-6, Lithium tantalum oxide

37220-89-6, Lithium aluminate 39302-37-9, Lithium titanium oxide 90076-65-6, Lithium bis(trifluoromethylsulfonyl)imide 152747-89-2, Lanthanum lithium oxide **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 236388-74-2, Lithium boride sulfide 236388-75-3, Aluminum lithium sulfide 342379-43-5, Germanium lithium sulfide
RL: DEV (Device component use); USES (Uses)
(fabrication of lithium anodes and batteries)

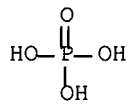
L30 ANSWER 10 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:900301 HCAPLUS Full-text
DOCUMENT NUMBER: 136:22000
TITLE: Anode of lithium secondary battery
INVENTOR(S): Kugai, Hirokazu; Ota, Nobuhiro; Yamanaka, Shosaku
PATENT ASSIGNEE(S): Sumitomo Electric Industries, Ltd., Japan
SOURCE: Eur. Pat. Appl., 5 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1162675	A2	20011212	EP 2001-305020 <--	20010608
EP 1162675	A3	20040908		
EP 1162675	B1	20061004		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2001351615	A	20011221	JP 2000-172073 <--	20000608
US 2002018939	A1	20020214	US 2001-838182 <--	20010420
US 6699619	B2	20040302		
PRIORITY APPLN. INFO.:			JP 2000-172073 A <--	20000608

AB A lithium-secondary-battery neg. electrode has a **protective layer** to prevent the surface deterioration of the inorg. solid electrolytic **layer**. The neg. electrode comprises **metallic lithium** or a **lithium**-containing **metal**, a first inorg. solid electrolytic **layer** (thickness: a) formed on the metal, and a second inorg. solid electrolytic **layer** (thickness: b) formed on the first inorg. solid electrolytic **layer**. The thickness ratio b/a is specified to be more than 0.5.

IT **10377-52-3**, Lithium phosphate
RL: DEV (Device component use); USES (Uses)
(anode of lithium secondary battery)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



IC ICM H01M004-02
ICS H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate
7439-93-2, Lithium, uses 7440-50-8, Copper, uses 10377-48-7,
Lithium sulfate **10377-52-3**, Lithium phosphate
12136-58-2, Lithium sulfide 12190-79-3, Cobalt lithium oxide
colio2 13453-84-4, Lithium silicate 13759-10-9, Silicon sulfide
sis2 21324-40-3, Lithium hexafluorophosphate 25014-41-9,
Polyacrylonitrile 196418-93-6, Lithium phosphate silicide sulfide
RL: DEV (Device component use); USES (Uses)
(anode of lithium secondary battery)

L30 ANSWER 11 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:397240 HCAPLUS Full-text
DOCUMENT NUMBER: 135:7792
TITLE: Lithium anodes for electrochemical cells
INVENTOR(S): Skotheim, Terje A.; Sheehan, Christopher J.; Mikhaylik, Yuriy V.
PATENT ASSIGNEE(S): Moltech Corporation, USA
SOURCE: PCT Int. Appl., 41 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001039303	A1	20010531	WO 2000-US32234	200011 21
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RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
AU 2001017967	A5	20010604	AU 2001-17967	200011 21
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EP 1234348	A1	20020828	EP 2000-980746	200011

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EP 1234348 B1 20031022
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JP 2003515893 T 20030507 JP 2001-540870
200011
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CN 1728418 A 20060201 CN 2005-10079023
200011
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PRIORITY APPLN. INFO.: US 1999-167171P P
199911
23
<--
CN 2000-818169 A3
200011
21
<--
WO 2000-US32234 W
200011
21
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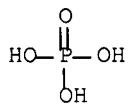
AB Provided are lithium anodes for use in electrochem. cells, where the anode active **layer** has a first **layer** comprising **lithium metal** and a second **layer** of a temporary **protective** material, wherein the temporary protective material is a metal capable of forming an alloy with **lithium metal** or is capable of diffusing into **lithium metal**. The present invention also pertains to methods of forming such anodes, electrochem. cells comprising such anodes, and methods of making such cells.

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(lithium anodes for electrochem. cells)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Battery anodes
Conducting polymers
Laser ablation
Sputtering
(lithium anodes for electrochem. cells)
IT **10377-52-3**, Lithium phosphate 11115-95-0, Lithium niobium oxide 12627-14-4, Lithium silicate 12674-25-8, Germanium lithium oxide 17372-42-8 25038-59-9, Polyethylene terephthalate, uses 37220-89-6, Lithium aluminate 152747-89-2, Lanthanum lithium oxide **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 342379-43-5, Germanium lithium sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(lithium anodes for electrochem. cells)
IT 7429-90-5, Aluminum, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses 7440-06-4, Platinum, uses 7440-22-4, Silver, uses 7440-31-5, Tin, uses 7440-43-9, Cadmium, uses 7440-50-8, Copper, uses 7440-55-3, Gallium, uses 7440-56-4, Germanium, uses 7440-57-5, Gold, uses 7440-66-6, Zinc, uses 7440-69-9, Bismuth, uses 7440-74-6, Indium, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(temporary protective **metal**; **lithium** anodes for electrochem. cells)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 12 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:397239 HCAPLUS Full-text
DOCUMENT NUMBER: 135:7791
TITLE: Lithium anodes for electrochemical cells
INVENTOR(S): Skotheim, Terje A.; Sheehan, Christopher J.; Mikhaylik, Yuriy V.; Affinito, John
PATENT ASSIGNEE(S): Moltech Corporation, USA
SOURCE: PCT Int. Appl., 39 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001039302	A1	20010531	WO 2000-US32232	200011 21

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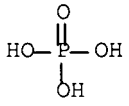
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

AU 2001016286	A5	20010604	AU 2001-16286	200011 21 <--
EP 1236231	A1	20020904	EP 2000-978872	200011 21 <--
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2003515892	T	20030507	JP 2001-540869	200011 21 <--
CN 1728418	A	20060201	CN 2005-10079023	200011 21 <--
PRIORITY APPLN. INFO.:			US 1999-167171P	P 199911 23 <--
			CN 2000-818169	A3 200011 21 <--
			WO 2000-US32232	W 200011 21 <--

AB Provided is an anode for use in electrochem. cells, wherein the anode active **layer** has a first **layer** comprising **lithium metal** and a multi-**layer** structure comprising single ion **conducting layers** and crosslinked polymer **layers** in contact with the first **layer** comprising **lithium metal** or in contact with an intermediate **protective layer**, such as a temporary **protective** metal **layer**, or plasma CO2 treatment **layers** on the surface of the lithium-containing first **layer**. The anodes of the current invention are particularly useful in electrochem. cells comprising sulfur-containing cathode active materials, such as elemental sulfur.

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(glass; lithium anodes for electrochem. cells)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



3 Li

RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component

		Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
IT **10377-52-3**, Lithium phosphate 11115-95-0, Lithium niobium oxide 12627-14-4, Lithium silicate 12676-27-6 12769-51-6, Lithium tantalum oxide 37220-89-6, Lithium aluminate 39302-37-9, Lithium titanium oxide 152747-89-2, Lanthanum lithium oxide **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 236388-74-2, Lithium boride sulfide 236388-75-3, Aluminum lithium sulfide 236388-76-4, Lithium phosphide sulfide 342379-43-5, Germanium lithium sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(glass; lithium anodes for electrochem. cells)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 13 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:397238 HCAPLUS Full-text
DOCUMENT NUMBER: 135:7790
TITLE: Methods of preparing electrochemical cells
INVENTOR(S): Carlson, Steven A.
PATENT ASSIGNEE(S): Moltech Corporation, USA
SOURCE: PCT Int. Appl., 99 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001039301	A2	20010531	WO 2000-US32140	200011 21
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WO 2001039301	A3	20020110		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
AU 2001019270	A5	20010604	AU 2001-19270	200011 21
			<--	

PRIORITY APPLN. INFO.: US 1999-167149P P

199911
23
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WO 2000-US32140 W
200011
21
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AB Provided are methods of preparing an anode/separator assembly for use in electrochem. cells in which a microporous separator **layer** , such as a microporous xerogel **layer**, is coated on a temporary carrier substrate, and an anode active **layer**, such as **lithium metal**, is then deposited on the separator **layer**, prior to removing the temporary carrier substrate from the separator **layer**. One or more **protective** coating **layers** may be coated before or after the coating step of the microporous separator **layer** and prior to depositing the anode active **layer**. Addnl. **layers**, including an edge insulating **layer**, an anode current collector **layer**, an electrode insulating **layer**, and a cathode current collector **layer**, may be applied subsequent to the coating step of the microporous separator **layer**. Also, provide are methods of preparing electrochem. cells utilizing anode/separator assemblies prepared by such methods, and anode/separator assemblies and electrochem. cells prepared by such methods.

IC ICM H01M004-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT **Conducting** polymers
(coatings; methods of preparing electrochem. cells)

L30 ANSWER 14 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:397232 HCAPLUS Full-text
DOCUMENT NUMBER: 135:7784
TITLE: Methods of preparing a cathode/separator assembly for use in electrochemical cells
INVENTOR(S): Carlson, Steven A.
PATENT ASSIGNEE(S): Moltech Corporation, USA
SOURCE: PCT Int. Appl., 100 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001039293	A2	20010531	WO 2000-US32231	200011 21
			<--	
WO 2001039293	A3	20020117		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
AU 2001017965	A5	20010604	AU 2001-17965	200011 21

			<--	
US 7066971	B1	20060627	US 2002-148156	200209 30
			<--	
PRIORITY APPLN. INFO.:			US 1999-167150P	P 199911 23
			<--	
			WO 2000-US32231	W 200011 21
			<--	

AB Provided are methods of preparing a cathode/separator assembly for use in electrochem. cells in which a **protective** coating **layer**, such as a single ion **conducting layer**, is coated on a temporary carrier substrate, a microporous separator **layer** is then coated on the **protective** coating **layer**, and a cathode active **layer** is then coated on the separator **layer**, prior to removing the temporary carrier substrate from the **protective** coating **layer**. Addnl. **layers** , including an edge insulating **layer**, a cathode current collector **layer**, an electrode insulating **layer**, an anode current collector **layer**, an anode **layer** such as a **lithium metal layer**, and an anode **protective layer**, such as a single ion **conducting layer**, may be applied subsequent to the coating step of the microporous separator **layer**. Also, provided are methods of preparing electrochem. cells utilizing cathode/separator assemblies prepared by such methods, and cathode/separator assemblies and electrochem. cells prepared by such methods.

IC ICM H01M002-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

IT **Conducting** polymers
(coatings; methods of preparing cathode/separator assembly for use in electrochem. cells)

L30 ANSWER 15 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER:	2000:725905 HCAPLUS Full-text
DOCUMENT NUMBER:	133:269464
TITLE:	Battery with an in-situ activation plated lithium anode
INVENTOR(S):	Neudecker, Bernd J.; Dudney, Nancy J.; Bates, John B.
PATENT ASSIGNEE(S):	Lockheed Martin Energy Research Corp., USA
SOURCE:	PCT Int. Appl., 28 pp. CODEN: PIXXD2
DOCUMENT TYPE:	Patent
LANGUAGE:	English
FAMILY ACC. NUM. COUNT:	1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000060689	A1	20001012	WO 2000-US6997	200003 17
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US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

US 6168884 B1 20010102 US 1999-285326 199904 02 <--

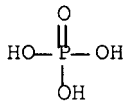
PRIORITY APPLN. INFO.: US 1999-285326 A1 199904 02 <--

AB A thin-film rechargeable battery includes: a cathode film including a **lithium** transition **metal** oxide, an electrolyte film coupled to the cathode film, the electrolyte film being substantially nonreactive with oxidizing materials and with **metallic lithium**, an anode current collector coupled to the electrolyte film; and an overlying **layer** coupled to the anode current collector. The thin-film rechargeable battery is activated during an initial charge by electrochem. plating of a **metallic lithium** anode between the anode current collector and the electrolyte film. The plating of the anode during charging and the stripping of the anode **layer** during discharging are essentially reversible. Therefore, almost no diminishment of discharge capacity occurs, even after many discharge and charge cycles. Other advantages include no need for special packaging for shipping and handling. The battery eliminates the main drawbacks of the thin-film Li-ion battery (high capacity loss during the initial charge) and of the thin-film lithium battery (high air-sensitivity at all times, temperature limited to .apprx.100°, expensive preparation of the lithium anode). The battery survives processing conditions that exceed those of a solder reflow process without any signs of degradation

IT **10377-52-3**, Lithiumphosphate li3po4
RL: DEV (Device component use); USES (Uses)
(battery with in-situ activation plated lithium anode)

RN 10377-52-3 HCAPLUS

CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

IT **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(overlying **layer** coupled to anode grid; battery with in-situ activation plated lithium anode)

RN 184905-46-2 HCAPLUS

CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M010-36
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(overlying **layer** coupled to anode grid; battery with in-situ activation plated lithium anode)
IT 7439-93-2, Lithium, uses **10377-52-3**, Lithiumphosphate li3po4 12031-65-1, Lithium nickel oxide linio2 12057-17-9, Lithium manganese oxide limn2o4 12190-79-3, Cobalt lithium oxide colio2
RL: DEV (Device component use); USES (Uses)
(battery with in-situ activation plated lithium anode)
IT 1304-28-5, Barium oxide bao, uses 1304-56-9, Beryllium oxide beo, uses 1305-78-8, Calcium oxide cao, uses 1309-48-4, Magnesia, uses 1312-81-8, Lanthana 1314-11-0, Strontium oxide sro, uses 1314-20-1, Thoria, uses 1314-36-9, Yttria, uses 7440-25-7, Tantalum, uses 7440-33-7, Tungsten, uses 7440-41-7, Beryllium, uses 7440-67-7, Zirconium, uses 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7631-86-9, Silica, uses 7789-24-4, Lithium fluoride, uses 9002-84-0, Ptfe 9002-88-4 10043-11-5, Boron nitride bn, uses 10377-51-2, Lithium iodide 12033-76-0, Silicon nitride oxide si2n2o 12033-89-5, Silicon nitride, uses 12060-08-1, Scandium oxide sc2o3 12169-03-8, Lithium yttrium oxide liyo2 12209-15-3, Lithium scandium oxide lisco2 12232-41-6, Beryllium lithium oxide be2li2o3 12355-58-7, Aluminum lithium oxide alli5o4 12384-10-0, Lithium zirconium oxide li8zro6 13453-84-4, Lithium silicate li4sio4 24304-00-5, Aluminum nitride 25722-33-2, Parylene 39449-52-0, Lithium silicate li8sio6 56320-64-0, Beryllium lithium oxide (BeLi4O3) 57349-02-7, Cerium lithium oxide celio2 **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(overlying **layer** coupled to anode grid; battery with in-situ activation plated lithium anode)
REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 16 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:113026 HCAPLUS Full-text
DOCUMENT NUMBER: 132:125362
TITLE: Protective coatings for battery anodes
INVENTOR(S): Visco, Steven J.; Chu, May-Ying
PATENT ASSIGNEE(S): Polyplus Battery Company, Inc., USA
SOURCE: U.S., 18 pp., Cont.-in-part of U.S. 5,789,108.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 15
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6025094	A	20000215	US 1998-86665	199805 29
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US 5523179	A	19960604	US 1994-344384	

				199411 23
			<--	
US 5582623	A	19961210	US 1995-479687	
				199506 07
			<--	
US 5686201	A	19971111	US 1996-686609	
				199607 26
			<--	
US 5789108	A	19980804	US 1997-814927	
				199703 11
			<--	
US 2001041294	A1	20011115	US 2001-901970	
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US 6723140	B2	20040420		
PRIORITY APPLN. INFO.:			US 1994-344384	A2
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			US 1995-479687	A2
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			US 1996-686609	A2
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			US 1997-814927	A2
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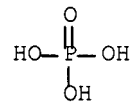
			US 1998-86665	A
				199805 29
			<--	
			US 1998-139601	A
				199808 25
			<--	
			US 1998-139603	A1
				199808 25
			<--	

AB Disclosed is an alkali metal neg. electrode having a **protective layer.** Specifically, the disclosed neg. electrode includes a glassy or amorphous surface **protective layer** which **conducts** alkali metal ions but effectively blocks the alkali metal in the electrode from direct contact with the ambient. The **protective layer** has improved smoothness and reduced internal stress in comparison to prior **protective layers** such as those formed by sputtering. In a specific embodiment, the **protective layer** is formed on the **lithium metal** electrode surface by a plasma assisted deposition technique.

IT **10377-52-3,** Lithium phosphate li3po4 **184905-46-2,** Lithium nitrogen phosphorus oxide
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(protective coatings for battery anodes)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-58
INCL 429231950
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 554-13-2, Lithium carbonate 1303-86-2, Boron oxide b2o3, uses 1314-80-3, Phosphorus pentasulfide 7631-86-9, Silica, uses 10377-51-2, Lithium iodide **10377-52-3**, Lithium phosphate li3po4 12057-24-8, Lithia, uses 12627-14-4, Lithium silicate 12676-27-6 26134-62-3, Lithium nitride 37220-89-6, Lithium aluminate **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 236388-74-2, Lithium boride sulfide 236388-75-3, Aluminum lithium sulfide 236388-76-4, Lithium phosphide sulfide
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(protective coatings for battery anodes)
REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 17 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:723300 HCAPLUS Full-text
DOCUMENT NUMBER: 131:312496
TITLE: Encapsulated lithium electrodes having glass **protective layers** and method for their preparation
INVENTOR(S): Visco, Steve J.; Tsang, Floris Y.
PATENT ASSIGNEE(S): Polyplus Battery Company, Inc., USA
SOURCE: PCT Int. Appl., 33 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 15
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9957770	A1	19991111	WO 1999-US6895	199903 29
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W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
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AU 9933713	A	19991123	AU 1999-33713	199903 29
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AU 745287	B2	20020321		
EP 1093672	A1	20010425	EP 1999-915119	199903 29
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EP 1093672	B1	20040825		
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BR 9910109	A	20011009	BR 1999-10109	199903 29
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JP 2002513991	T	20020514	JP 2000-547661	199903 29
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AT 274752	T	20040915	AT 1999-915119	199903 29
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US 6432584	B1	20020813	US 2000-678063	200010 02
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PRIORITY APPLN. INFO.:			US 1998-83947P P	199805 01
			<--	
			US 1998-139601 A	199808 25
			<--	
			WO 1999-US6895 W	

199903
29

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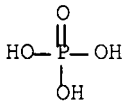
AB A method for fabricating an active **metal** electrode involves depositing **lithium** or other active **metal** electrode on a **protective layer**. The **protective layer** is a glassy or amorphous material that **conducts** ions of the active metal. It may be deposited on a releasable web carrier or other substrate such as polymer electrolyte **layer**. Lithium is then deposited on the **protective layer**. Finally, a current collector is attached to the lithium.

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: DEV (Device component use); USES (Uses)
(**protective layer** containing; encapsulated lithium electrodes having glass **protective layers** and method for their preparation)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



3 Li

RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-02
ICS H01M004-04; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

IT Secondary batteries
(Li-S; encapsulated lithium electrodes having glass **protective layers** and method for their preparation)

IT Battery anodes
Encapsulation
Polymer electrolytes
(encapsulated lithium electrodes having glass **protective layers** and method for their preparation)

IT Polyethers, uses
Polymers, uses
Polyphosphazenes
Polythioethers
RL: DEV (Device component use); USES (Uses)
(gel electrolyte containing; encapsulated lithium electrodes having glass **protective layers** and method for their preparation)

IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(gel or solid electrolyte containing; encapsulated lithium electrodes having glass **protective layers** and method for their preparation)
IT Battery electrolytes
(gel; encapsulated lithium electrodes having glass **protective layers** and method for their preparation)
IT Imines
RL: DEV (Device component use); USES (Uses)
(polyimines, gel electrolyte containing; encapsulated lithium electrodes having glass **protective layers** and method for their preparation)
IT 7440-02-0, Nickel, uses 12597-68-1, Stainless steel, uses
RL: DEV (Device component use); USES (Uses)
(current collector; encapsulated lithium electrodes having glass **protective layers** and method for their preparation)
IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(encapsulated lithium electrodes having glass **protective layers** and method for their preparation)
IT **10377-52-3**, Lithium phosphate 12627-14-4, Lithium silicate 12676-27-6 37220-89-6, Lithium aluminate **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 236388-74-2, Lithium boride sulfide 236388-75-3, Aluminum Lithium sulfide 236388-76-4, Lithium phosphide sulfide
RL: DEV (Device component use); USES (Uses)
(**protective layer** containing; encapsulated lithium electrodes having glass **protective layers** and method for their preparation)
IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7440-31-5, Tin, uses 7440-50-8, Copper, uses 7440-66-6, Zinc, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(releasable web carrier; encapsulated lithium electrodes having glass **protective layers** and method for their preparation)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 18 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:549496 HCAPLUS Full-text
DOCUMENT NUMBER: 131:146969
TITLE: Plating metal anodes under protective coatings for use in batteries
INVENTOR(S): Chu, May-Ming; Visco, Steven J.; De Jonghe, Lutgard C.
PATENT ASSIGNEE(S): Polyplus Battery Company, Inc., USA
SOURCE: PCT Int. Appl., 40 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 15
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9943034	A1	19990826	WO 1999-US3335	199902

17
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W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ,
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IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD,
MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI,
SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK,
ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

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AU 743685	B2	20020131		
BR 9908010	A	20001024	BR 1999-8010	199902 17
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EP 1057222	A1	20001206	EP 1999-934368	199902 17
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
PT, IE, LV, FI

JP 2002504741	T	20020212	JP 2000-532875	199902 17
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PRIORITY APPLN. INFO.:	US 1998-75017P	P	199802 18
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	US 1998-139603	A	199808 25
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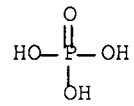
	WO 1999-US3335	W	199902 17
	<--		

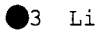
AB A method for forming lithium electrodes having **protective layers** involves plating lithium between a lithium ion **conductive protective layer** and a current collector of an electrode precursor. The electrode precursor is formed by depositing the **protective layer** on a very smooth surface of a current collector. The **protective layer** is a glass such as lithium phosphorus oxynitride and the current collector is a **conductive** sheet such as a copper sheet. During plating, lithium ions move through the **protective layer** and a **lithium metal layer** plates onto the surface of the current collector. The resulting structure is a protected lithium electrode. To facilitate uniform lithium plating, the electrode precursor may include a wetting **layer** which coats the current collector.

IT **7439-93-2, Lithium**, uses

RL: DEV (Device component use); FMU (Formation, unclassified); FORM (Formation, nonpreparative); USES (Uses)
(plating **metal** anodes under protective coatings for use in batteries)
RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(**protective layer**; plating metal anodes under protective coatings for use in batteries)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)





RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-04
ICS H01M004-12; H01M010-36; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Primary batteries
Secondary batteries
(**lithium**; plating **metal** anodes under protective coatings for use in batteries)
IT 7429-90-5, Aluminum, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-31-5, Tin, uses 7440-44-0, Carbon, uses 11126-12-8, Iron sulfide 12673-92-6, Titanium sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(anode precursor, wetting **layer** material; plating metal anodes under protective coatings for use in batteries)
IT **7439-93-2**, **Lithium**, uses
RL: DEV (Device component use); FMU (Formation, unclassified); FORM (Formation, nonpreparative); USES (Uses)
(plating **metal** anodes under protective coatings for use

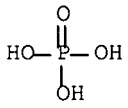
in batteries)
IT 74432-42-1, **Lithium** polysulfide 236388-74-2, **Lithium** boride sulfide 236388-76-4, **Lithium** phosphide sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(plating **metal** anodes under protective coatings for use in batteries)
IT **10377-52-3**, Lithium phosphate 12627-14-4, Lithium silicate 12676-27-6 37220-89-6, Lithium aluminate **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 236388-75-3, Aluminum lithium sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(**protective layer**; plating metal anodes under protective coatings for use in batteries)
REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L30 ANSWER 19 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:147847 HCAPLUS Full-text
DOCUMENT NUMBER: 130:170658
TITLE: Electrode-electrolyte unit and its production and use in thin-film battery and electrochromic device
INVENTOR(S): Weppner, Werner; Birke, Peter
PATENT ASSIGNEE(S): Germany
SOURCE: Ger. Offen., 14 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19735803	A1	19990225	DE 1997-19735803 <--	19970818
DE 19735803	B4	20061019		
PRIORITY APPLN. INFO.:			DE 1997-19735803 <--	19970818

AB The unit includes an electrode of a **conducting** ions-forming element, such as **Li**, and a transition **metal**-containing oxide, sulfide, nitride, fluoride, chloride, and/or carbide; or an alloy of a **conducting** ion-forming element; and an electrolyte of a **conducting** ions-forming element, such as Li, and a main group element- and/or transition metal-containing oxide, sulfide, nitride, fluoride, and/or chloride. The fabrication efficiency and the elec. properties of the unit can be improved by providing a **conducting** ions- **conducting** intermediate **layer** between the electrode and the electrolyte and/or by simultaneous insertion of the **conducting** ions-forming element into the cathode material and by oxidizing the electrolyte by closing and outer plasma-including current circuit.
IT **10377-52-3P**, Trilithium phosphate
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(in electrode-electrolyte unit for use in thin-film battery and electrochromic device)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

IT **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(in electrode-electrolyte unit for use in thin-film battery and electrochromic device)
RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M010-02
ICS C23C016-50; G09F009-35; G02F001-153
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 74
IT 1314-35-8DP, Tungsten oxide (WO3), lithiated, uses
10377-52-3P, Trilithium phosphate 12031-66-2P, Lithium tantalum oxide (LiTaO3) 52627-24-4P, Cobalt lithium oxide
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(in electrode-electrolyte unit for use in thin-film battery and electrochromic device)
IT 17372-42-8 **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(in electrode-electrolyte unit for use in thin-film battery and electrochromic device)

L30 ANSWER 20 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1996:737949 HCAPLUS Full-text
DOCUMENT NUMBER: 126:39466
TITLE: Organic thin-film light-emitting device
INVENTOR(S): Nanba, Noryoshi; Nakatani, Kenji; Arai, Michio
PATENT ASSIGNEE(S): Tdk Electronics Co Ltd, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

JP 08264279	A	19961011	JP 1995-93023	199503 27

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PRIORITY APPLN. INFO.: JP 1995-93023 199503 27

<--

AB In the device comprising a substrate successively laminated with, from the bottom, 1st electrode, an electron-transporting **layer** and a light-emitting **layer**, 2nd transparent electrode, and a **protective layer**; the 1st electrode is made of an elec. **conductive** C interlayer compound containing a metal of work function ≤3.0eV. The cathode may be hardly graphitizable C containing Li. The device high electron-injecting efficiency.

IT **7439-93-2**, Lithium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(carbon interlayer compound containing; organic thin-film light-emitting device having cathodes of **metal**-containing carbonaceous interlayer compound)

RN 7439-93-2 HCAPLUS

CN Lithium (CA INDEX NAME)

Li

IC ICM H05B033-26

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

IT **7439-93-2**, Lithium, uses 7440-09-7, Potassium, uses 7440-19-9, Samarium, uses 7440-23-5, Sodium, uses 7440-46-2, Cesium, uses 7440-53-1, Europium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(carbon interlayer compound containing; organic thin-film light-emitting device having cathodes of **metal**-containing carbonaceous interlayer compound)

L30 ANSWER 21 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1994:461539 HCAPLUS Full-text

DOCUMENT NUMBER: 121:61539

TITLE: Protective lithium ion **conducting** ceramic coating for **lithium** **metal** anodes

INVENTOR(S): Bates, John B.

PATENT ASSIGNEE(S): Martin Marietta Energy Systems, Inc., USA

SOURCE: U.S., 4 pp.
CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

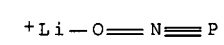
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5314765	A	19940524	US 1993-137285	199310 14

<--
PRIORITY APPLN. INFO.: US 1993-137285
199310
14
<--

AB In a battery including a cathode, a lithium anode and an electrolyte between the anode and cathode, a thin-film of lithium phosphorus oxynitride is used to coat the anode and sep. it from the electrolyte. A preliminary **layer** of lithium nitride may be coated on the anode before the lithium phosphorous oxynitride is coated on the anode so that separation of the anode and electrolyte is further enhanced. By coating the lithium anode with this material lay-up, the life of the battery is lengthened and the performance of the battery is enhanced.

IT **150272-61-0**
RL: USES (Uses)
(lithium anode coating with)

RN 150272-61-0 HCAPLUS
CN Lithium(1+), (phosphorous nitride N-oxide-O)- (9CI) (CA INDEX NAME)



IC ICM H01M010-40
INCL 429194000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 26134-62-3, Lithium nitride **150272-61-0**
RL: USES (Uses)
(lithium anode coating with)

L30 ANSWER 22 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1992:259053 HCAPLUS Full-text
DOCUMENT NUMBER: 116:259053
TITLE: Secondary batteries with coated anodes
INVENTOR(S): Nakane, Ikuro; Fujita, Yasuhiro; Furukawa, Sanehiro
PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 04028172	A	19920130	JP 1990-131673	199005 22
			<--	
JP 3030053	B2	20000410		

PRIORITY APPLN. INFO.: JP 1990-131673
199005
22
<--

AB The batteries use MnO2, MoO3, V2O5, or TiS2 cathodes and alkali **metal** (e.g., **Li**), alkaline earth **metal**, or Al anodes, which are coated with a 1st **protective layer** and an elastomer-, **conducting** polymer-, or ion-**conductive** polymer-based **layer**. The 1st **layer** may be salts, oxides, or hydroxides of alkali or alkaline earth

metals or compds. of P, As, Sb, and/or Bi, the elastomer may be ethylene-propylene or ethylene-propylene-nonconjugated diene copolymers, the **conducting** polymer may be poly(p-phenylene), polyacetylene, polyaniline, polypyrrole, etc., and the ion-**conductive** polymer may be PEO or other polymers containing dispersed Li salts. These batteries have long cycle life.

IC ICM H01M010-40
ICS H01M004-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

L30 ANSWER 23 OF 23 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1986:450872 HCAPLUS Full-text
DOCUMENT NUMBER: 105:50872
TITLE: Inert electrode composition having agent for controlling oxide growth on electrode made therefrom
INVENTOR(S): Ray, Siba P.
PATENT ASSIGNEE(S): Aluminum Co. of America, USA
SOURCE: U.S., 14 pp. Cont.-in-part of U.S. Ser. No 596,020.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 8
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4582585	A	19860415	US 1984-682909 <--	19841218
US 4454015	A	19840612	US 1982-423673 <--	19820927
US 4584172	A	19860422	US 1984-596020 <--	19840503
PRIORITY APPLN. INFO.:			US 1982-423673 A3 <--	19820927
			US 1984-596020 A2 <--	19840503

AB An inert electrode composition is described, which is suitable for use as an inert electrode in the production of metals, such as Al, by the electrolytic reduction of a metal oxide or metal salt dissolved in a molten salt bath. The composition comprises ≥1 metal alloy and metal compound, which may include oxides of the metals (e.g. Ni-Fe) comprising the alloy. The alloy and metal compds are interwoven in a network which provides improved elec. **conductivity** and mech. strength while preserving the level of chemical inertness necessary for such an electrode to function satisfactorily. The electrode composition further includes a metal compound dopant (e.g., Al2O3) which aids in controlling the thickness of a **protective** oxide **layer** on at least the bottom portion of an electrode made from the composition during use.

IT **7439-93-2**, uses and miscellaneous

RL: USES (Uses)
(dopants, for control of oxide formation in inert electrodes for **metal** electroprodn. in salt melts)
RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

Li

IC ICM C25C003-00
ICS C25B011-04
INCL 204243000R
CC 72-9 (Electrochemistry)
IT **7439-93-2**, uses and miscellaneous 7439-95-4, uses and miscellaneous 7439-96-5, uses and miscellaneous 7440-03-1, uses and miscellaneous 7440-21-3, uses and miscellaneous 7440-25-7, uses and miscellaneous 7440-31-5, uses and miscellaneous 7440-32-6, uses and miscellaneous 7440-47-3, uses and miscellaneous 7440-48-4, uses and miscellaneous 7440-50-8, uses and miscellaneous 7440-65-5, uses and miscellaneous 7440-67-7, uses and miscellaneous 7440-70-2, uses and miscellaneous
RL: USES (Uses)
(dopants, for control of oxide formation in inert electrodes for **metal** electroprodn. in salt melts)

=>

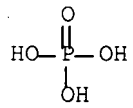
JP 61263069	A	19861121	JP 1985-105109	198505 17
PRIORITY APPLN. INFO.:			JP 1985-105109	198505 17

AB The long storage-life batteries without explosion and electrolyte leakage have anodes of a **Li**-intercalated transition **metal** oxide coated with a Li ion-conducting solid (Li3PO4 + Li4SiO4, LiTaO3, or LiACF4). The oxide is selected from oxides of W, Mo, Ti, Ta, and V. A composite of WO3-C cathode, 1M LiClO4 in propylene carbonate electrolyte, and a vacuum-deposited WO3 **layer** sputtered with a 2-μ LiTaO3 **layer** were assembled. Li was intercalated into the WO3 **layer** by short circuiting the **layer** with Li in an organic electrolyte for 1 wk to form an anode. The battery showed an open-circuit voltage of 2.8 V and a 10% capacity decrease after 200 charge-discharge cycles. No explosion or electrolyte leakage was observed A control battery having an anode without the LiTaO3 **layer** showed 80% capacity decrease after 50 cycles, and electrolyte leakage was observed

IT **10377-52-3**, Trilithium phosphate
RL: USES (Uses)
(anodes with surface **layer** of, **lithium** -intercalated **metal** oxide, for nonaq.-electrolyte batteries)

RN 10377-52-3 HCAPLUS

CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



3 Li

IC ICM H01M010-40
ICS H01M010-36

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72

IT Anodes
(battery, **lithium**-intercalated **metal** oxide, with ion-conducting surface **layer**)

IT 1313-27-5, Molybdenum oxide (MoO3), properties 1314-35-8, Tungsten oxide (WO3), properties 1314-61-0 1314-62-1, Vanadium oxide (V2O5), properties 13463-67-7, Titanium dioxide, properties
RL: PRP (Properties)
(anodes from lithium-intercalated, with ion conducting surface **layer**, for nonaq.-electrolyte batteries)

IT **10377-52-3**, Trilithium phosphate 12031-66-2, Lithium tantalum oxide (LiTaO3) 13453-84-4, Tetralithium silicate
RL: USES (Uses)
(anodes with surface **layer** of, **lithium** -intercalated **metal** oxide, for nonaq.-electrolyte batteries)

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DICTIONARY FILE UPDATES:   6 MAY 2007  HIGHEST RN 934336-20-6

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     FILE 'REGISTRY' ENTERED AT 12:06:20 ON 07 MAY 2007
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L2         9750 SEA ABB=ON  PLU=ON  (LI(L)P(L)O)/ELS
L3          105 SEA ABB=ON  PLU=ON  L2(L)H/ELS (L) 4/ELC.SUB
L4           69 SEA ABB=ON  PLU=ON  L2(L)N/ELS (L) 4/ELC.SUB
L5           20 SEA ABB=ON  PLU=ON  L2(L)3/ELC.SUB

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L6         4889 SEA ABB=ON  PLU=ON  L1(L)METAL?
L7              QUE ABB=ON  PLU=ON  (LITHIUM OR LI)(3A)METAL?
L8         2014 SEA ABB=ON  PLU=ON  L3 OR L5
L9          181 SEA ABB=ON  PLU=ON  L4
L10             QUE ABB=ON  PLU=ON  LAYER? OR OVERLAY?
L11         141 SEA ABB=ON  PLU=ON  (L6 OR L7) AND L8
L12          33 SEA ABB=ON  PLU=ON  L11 AND L10
L13          31 SEA ABB=ON  PLU=ON  L11 AND L9
L14          17 SEA ABB=ON  PLU=ON  L13 AND L10
L15             QUE ABB=ON  PLU=ON  THICK?
L16           4 SEA ABB=ON  PLU=ON  L14 AND L15
L17           6 SEA ABB=ON  PLU=ON  L12 AND L15
L18           6 SEA ABB=ON  PLU=ON  L16 OR L17
L19          27 SEA ABB=ON  PLU=ON  (L12 OR L14) NOT L18


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FILE LAST UPDATED: 6 May 2007 (20070506/ED)
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FILE COVERS 1907 - 7 May 2007 VOL 146 ISS 20
FILE LAST UPDATED: 1 May 2007 (20070501/ED)

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This file contains CAS Registry Numbers for easy and accurate

=> d l18 ibib abs hitstr hitind 1-6

L18 ANSWER 1 OF 6 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:301567 HCAPLUS Full-text
DOCUMENT NUMBER: 144:334260
TITLE: Composition precursor for aluminum-containing **lithium** transition **metal** oxide and process for preparation of the same
INVENTOR(S): Paulsen, Jens M.; Kwon, Yonghoon; Jang, Jaeup; Park, Hong-Kyu
PATENT ASSIGNEE(S): Lg Chem, Ltd., S. Korea
SOURCE: PCT Int. Appl., 30 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006033525	A1	20060330	WO 2005-KR2951	200509 06
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
US 2006068289	A1	20060330	US 2004-950105	200409 24

PRIORITY APPLN. INFO.: US 2004-950105 A

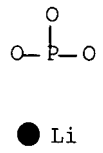
200409
24

AB The present invention provides a powdery composite precursor, which comprises a core of a **lithium** transition **metal** oxide, and an aluminum hydroxide-based precipitate **layer** coated on the surface of the core, and a process to prepare the composite precursor. The preparation process comprises the formation of a water based slurry by dispersing **lithium** transition **metal** oxide powder in water, and a precipitation reaction of an aluminum salt solution with a base solution where the **lithium** transition **metal** particles act as seed particles, whereby a mech. stable precipitate **layer** of homogeneous **thickness** can be achieved. The composite precursor can be converted into aluminum-containing, e.g., aluminum-doped, **lithium** transition **metal** oxide suitable for a cathode active material of lithium rechargeable battery by heat treatment.

IT **13762-75-9**, Lithium metaphosphate
RL: MOA (Modifier or additive use); USES (Uses)
(process for preparation of composition precursor for aluminum-containing **lithium** transition **metal** oxide)

RN 13762-75-9 HCAPLUS

CN Metaphosphoric acid (HPO3), lithium salt (8CI, 9CI) (CA INDEX NAME)



ONE OR MORE TAUTOMERIC DOUBLE BONDS NOT DISPLAYED IN THE STRUCTURE

IC ICM H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

ST battery cathode aluminum **lithium** transition **metal** oxide composite precursor

IT Transition **metal** oxides
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**lithium**-conth.; process for preparation of composition precursor for aluminum-containing **lithium** transition **metal** oxide)

IT Secondary batteries
(lithium; process for preparation of composition precursor for aluminum-containing **lithium** transition **metal** oxide)

IT Battery cathodes
Heat treatment
(process for preparation of composition precursor for aluminum-containing **lithium** transition **metal** oxide)

IT 7429-90-5, Aluminum, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(coating; process for preparation of composition precursor for aluminum-containing **lithium** transition **metal** oxide)

IT 497-19-8, Sodium carbonate, processes 506-87-6, Ammonium carbonate 554-13-2, Lithium carbonate 1310-58-3, Potassium hydroxide, processes 1310-65-2, Lithium hydroxide 1310-73-2, Sodium hydroxide, processes 1336-21-6, Ammonium hydroxide 7429-90-5D, Aluminum, salt 7786-81-4, Nickel sulfate 10024-42-7, Aluminum

sodium sulfate 10043-01-3, Aluminum sulfate 10124-43-3, Cobalt sulfate 15007-61-1, Aluminum potassium sulfate 21645-51-2, Aluminum hydroxide, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(process for preparation of composition precursor for aluminum-containing **lithium** transition **metal** oxide)

IT 183451-80-1 227623-80-5, Cobalt lithium manganese nickel oxide (Co0.8LiMn0.1Ni0.1O2) 352197-83-2
RL: DEV (Device component use); USES (Uses)
(process for preparation of composition precursor for aluminum-containing **lithium** transition **metal** oxide)

IT **13762-75-9**, Lithium metaphosphate 13821-20-0, Aluminum lithium fluoride alli3f6
RL: MOA (Modifier or additive use); USES (Uses)
(process for preparation of composition precursor for aluminum-containing **lithium** transition **metal** oxide)

IT 150607-28-6P 880762-58-3P, Aluminum lithium sulfate (Al0.7Li0.3(SO4)1.2)
RL: SPN (Synthetic preparation); PREP (Preparation)
(process for preparation of composition precursor for aluminum-containing **lithium** transition **metal** oxide)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L18 ANSWER 2 OF 6 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:269693 HCAPLUS Full-text
DOCUMENT NUMBER: 144:295967
TITLE: Metal-air battery with ion-conducting inorganic glass electrolyte
INVENTOR(S): Jang, Bor Z.
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 9 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2006063051	A1	20060323	US 2004-944667	200409 20
PRIORITY APPLN. INFO.:			US 2004-944667	200409 20

AB The invention concerns a solid-state metal-air electrochem. cell comprising: (a) a metal-containing electroactive anode; (b) an oxygen electroactive cathode; and (c) an ion-conducting glass electrolyte disposed between the metal-containing anode and the oxygen electroactive cathode. The cathode active material, which is oxygen gas, is not stored in the battery but rather fed from the environment. The oxygen cathode is preferably a composite carbon electrode which serves as the cathode current collector on which oxygen mols. are reduced during discharge of the battery to generate elec. current. The glass electrolyte typically has an ion conductivity in the range of 5+10-5 to 2+10-3 S/cm. The electrolyte **layer** is preferably smaller than 10 μm in **thickness** and further preferably smaller than 1

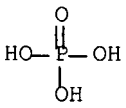
μm. The anode **metal** is preferably **lithium** or lithium alloy, but may be selected from other elements such as sodium, magnesium, calcium, aluminum and zinc.

IT **7439-93-2, Lithium**, uses **10377-52-3, Lithium** phosphate **184905-46-2, Lithium** nitrogen phosphorus oxide
RL: DEV (Device component use); USES (Uses)
(**metal**-air battery with ion-conducting inorg. glass electrolyte)

RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

Li

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



3 Li

RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

INCL 429029000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57

IT Borate glasses
RL: DEV (Device component use); USES (Uses)
(**lithium** borate; **metal**-air battery with ion-conducting inorg. glass electrolyte)

IT Phosphate glasses
RL: DEV (Device component use); USES (Uses)
(**lithium** phosphate; **metal**-air battery with ion-conducting inorg. glass electrolyte)

IT Silicate glasses
RL: DEV (Device component use); USES (Uses)
(**lithium** silicate; **metal**-air battery with ion-conducting inorg. glass electrolyte)

IT Glass, uses
RL: DEV (Device component use); USES (Uses)
(**lithium** silicon borate sulfide; **metal**-air battery with ion-conducting inorg. glass electrolyte)

IT Glass, uses
RL: DEV (Device component use); USES (Uses)
(**lithium** silicon phosphate sulfide; **metal**-air battery with ion-conducting inorg. glass electrolyte)
IT Glass, uses
RL: DEV (Device component use); USES (Uses)
(**lithium** silicon silicate sulfide; **metal**-air battery with ion-conducting inorg. glass electrolyte)
IT **Lithium** alloy, base
RL: DEV (Device component use); USES (Uses)
(**metal**-air battery with ion-conducting inorg. glass electrolyte)
IT 12136-58-2, **Lithium** sulfide (Li2S) 13759-10-9, Silicon sulfide (SiS2)
RL: DEV (Device component use); USES (Uses)
(glass; **metal**-air battery with ion-conducting inorg. glass electrolyte)
IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses **7439-93-2**, **Lithium**, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7440-02-0, Nickel, uses 7440-09-7, Potassium, uses 7440-17-7, Rubidium, uses 7440-23-5, Sodium, uses 7440-24-6, Strontium, uses 7440-32-6, Titanium, uses 7440-39-3, Barium, uses 7440-41-7, Beryllium, uses 7440-44-0, Carbon, uses 7440-46-2, Cesium, uses 7440-47-3, Chromium, uses 7440-66-6, Zinc, uses 7440-70-2, Calcium, uses **10377-52-3**, **Lithium** phosphate 11102-77-5 12627-14-4, **Lithium** silicate 12676-27-6 12798-95-7 37186-88-2 37220-89-6, **Lithium** aluminate 39300-27-1 53680-59-4 65777-94-8 **184905-46-2**, **Lithium** nitrogen phosphorus oxide 236388-73-1, **Lithium** silicide sulfide 236388-75-3, Aluminum **lithium** sulfide 236388-76-4, **Lithium** phosphide sulfide
RL: DEV (Device component use); USES (Uses)
(**metal**-air battery with ion-conducting inorg. glass electrolyte)
IT 178958-56-0P, **Lithium** silicon oxide
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(**metal**-air battery with ion-conducting inorg. glass electrolyte)

L18 ANSWER 3 OF 6 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:391728 HCAPLUS Full-text
DOCUMENT NUMBER: 140:378090
TITLE: Anodes for lithium-sulfur batteries, their manufacture, and lithium-sulfur batteries using them
INVENTOR(S): Lee, Jong Ki; Lee, Je Won; Cho, Joung Keun; Lee, Sang Muk; Kim, Min Hyup
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004139968	A	20040513	JP 2003-276606	200307 18
KR 2004035100	A	20040429	KR 2002-63834	200210 18
US 2004137330	A1	20040715	US 2003-688781	200310 17
CN 1508893	A	20040630	CN 2003-10123734	200310 18

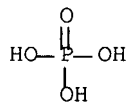
PRIORITY APPLN. INFO.: KR 2002-63834 A 200210 18

AB The anodes for lithium-sulfur batteries are manufactured by forming a pretreatment **layer** (**thickness** 50-5000 Å) containing Li+-conductive substances having ionic conductivity ≥1 + 10-10 S/cm on **Li metal** by vapor deposition under inert gas atmospheric and forming a **Li metal**-protective film by vapor deposition. Preferably, the Li+-conductive substance may be Li3PO4 and the protective **layer** contains Li2.9PO3.3N0.46. Lithium-sulfur batteries contain the anodes above and cathodes containing cathode active materials selected from S element, S-series compds., and their mixts. The anode pretreatment **layer** shows high ionic conductivity and no volume expansion.

IT **7439-93-2**, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(manufacture of lithium-sulfur battery anodes having Li+-conductive pretreatment **layer** and **Li metal** -protective **layer**)
RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

Li

IT **10377-52-3**, Lithium phosphate
RL: DEV (Device component use); USES (Uses)
(pretreatment **layer**; manufacture of lithium-sulfur battery anodes having Li+-conductive pretreatment **layer** and **Li metal**-protective **layer**)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



3 Li

IT **150499-39-1**, Lithium metaphosphate nitride oxide (Li2.9(PO3)N0.46O0.3)
RL: DEV (Device component use); USES (Uses)

(protective **layer**; manufacture of lithium-sulfur battery anodes having Li+-conductive pretreatment **layer** and **Li metal**-protective **layer**)

RN 150499-39-1 HCAPLUS

CN Lithium metaphosphate nitride oxide (Li2.9(PO3)N0.46O0.3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.46	17778-88-0
O	0.3	17778-80-2
O3P	1	15389-19-2
Li	2.9	7439-93-2

IC ICM H01M004-02
ICS H01M004-04; H01M004-40; H01M004-62; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72

IT Controlled atmospheres
(inert, in vapor deposition; manufacture of lithium-sulfur battery anodes having Li+-conductive pretreatment **layer** and **Li metal**-protective **layer**)

IT Secondary batteries
(lithium-sulfur; manufacture of lithium-sulfur battery anodes having Li+-conductive pretreatment **layer** and **Li metal**-protective **layer**)

IT Battery anodes
Battery cathodes
Ionic conductors
Vapor deposition process
(manufacture of lithium-sulfur battery anodes having Li+-conductive pretreatment **layer** and **Li metal** -protective **layer**)

IT 7704-34-9, Sulfur, uses
RL: DEV (Device component use); USES (Uses)
(cathode; manufacture of lithium-sulfur battery anodes having Li+-conductive pretreatment **layer** and **Li metal**-protective **layer**)

IT 7440-01-9, Neon, uses 7440-37-1, Argon, uses 7440-59-7, Helium, uses
RL: NUU (Other use, unclassified); USES (Uses)
(inert atmospheric in vapor deposition; manufacture of lithium-sulfur battery anodes having Li+-conductive pretreatment **layer** and **Li metal**-protective **layer**)

IT **7439-93-2**, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(manufacture of lithium-sulfur battery anodes having Li+-conductive pretreatment **layer** and **Li metal** -protective **layer**)

IT **10377-52-3**, Lithium phosphate
RL: DEV (Device component use); USES (Uses)
(pretreatment **layer**; manufacture of lithium-sulfur battery anodes having Li+-conductive pretreatment **layer** and **Li metal**-protective **layer**)

IT **150499-39-1**, Lithium metaphosphate nitride oxide (Li2.9(PO3)N0.46O0.3)
RL: DEV (Device component use); USES (Uses)
(protective **layer**; manufacture of lithium-sulfur battery anodes having Li+-conductive pretreatment **layer** and

Li metal-protective **layer**)

L18 ANSWER 4 OF 6 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:306576 HCAPLUS Full-text
DOCUMENT NUMBER: 139:182767
TITLE: Li3PO4:N/LiCoO2 coatings for thin film batteries
AUTHOR(S): Gross, M. E.; Martin, P. M.; Stewart, D. C.; Johnston, J. W.; Windisch, C. F.; Graff, G. L.; Rissmiller, P. L.; Dudeck, E. L.
CORPORATE SOURCE: Pacific Northwest National Laboratory, Richland, WA, USA
SOURCE: Annual Technical Conference Proceedings - Society of Vacuum Coaters (2002), 45th, 119-124
CODEN: ATCCDI; ISSN: 0731-1699
PUBLISHER: Society of Vacuum Coaters
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Li3PO4:N (LIPON)/Li1.04CoO2 thin film battery structures were deposited up to 2 μm **thick** were deposited using a 15.2 cm diameter Li2.9PO3.5 pressed powder target for reactive RF magnetron sputtering. Li1.04CoO2 thin films were deposited using a 15.2 cm diameter LiCoO2 pressed powder target. LIPON films were deposited in an ultra pure N2 atmosphere and LiCoO2 films were deposited in an ultra pure atmospheric of Ar + O2. Total chamber pressure during deposition ranged between 5 and 20 mtorr and RF power to the sputtering targets ranged from 100 W to 450 W. Because XPS gave ambiguous compositional results, the films were optimized for a.c. and d.c. conductivity Elec. conductivity was extremely sensitive to deposition conditions, deposition rate, sputtering gas pressure, and reactive gas partial pressure. AC conductivity measurements were made at a frequency of 10 kHz, and were correlated to d.c. conductivity measurements. LIPON films had the highest conductivities in the 660 nS cm-1 range and the highest a.c. conductivity of Li1.04CoO2 films was .apprx.0.24 S cm-1. Earlier work showed the most conductive films were deposited at 20 mtorr pressures and target powers of 100 W. This work has scaled up to conductive films being deposited at 7.5 mtorr pressures and target powers of 400 W. X-ray diffraction anal. showed that the films were mostly amorphous. Films deposited under these conditions were transparent at visible wavelengths with a refractive index of 1.6. Lower conductivity films were brownish in appearance and had less transmission than films with high conductivity The rechargeable battery structure consisting of an alumina substrate, gold current collector, 0.5-μm Li1.04CoO2 cathode, 1.2-μm LIPON electrolyte, **Li metal** anode, and a copper current collector are currently under test. Early thin film battery cycle testing was successful, addnl. testing is on-going. Performance results are correlated with film properties and reported. Future work will involve optimization of battery performance on a large scale and scale up of the deposition process to include flexible web processing.

IT **203402-92-0P**, Lithium nitride phosphate
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(LIPON, sputtered **layer**; Li3PO4:N/LiCoO2 coatings for thin film secondary batteries)
RN 203402-92-0 HCAPLUS
CN Lithium nitride phosphate (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O4P	x	14265-44-2
Li	x	7439-93-2

IT **581094-51-1**, Lithium metaphosphate oxide (Li2.9(PO3)O0.5)

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(pressed powder target; Li3PO4:N/LiCoO2 coatings for thin film secondary batteries)
RN 581094-51-1 HCAPLUS
CN Lithium metaphosphate oxide (Li2.9(PO3)O0.5) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.5	17778-80-2
O3P	1	15389-19-2
Li	2.9	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57
IT **203402-92-0P**, Lithium nitride phosphate
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(LIPON, sputtered **layer**; Li3PO4:N/LiCoO2 coatings for thin film secondary batteries)
IT **581094-51-1**, Lithium metaphosphate oxide (Li2.9(PO3)O0.5)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(pressed powder target; Li3PO4:N/LiCoO2 coatings for thin film secondary batteries)
IT 152829-46-4P, Cobalt lithium oxide (CoLi1.04O2)
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(sputtered **layer**, cathode; Li3PO4:N/LiCoO2 coatings for thin film secondary batteries)
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L18 ANSWER 5 OF 6 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:925553 HCAPLUS Full-text
DOCUMENT NUMBER: 138:15255
TITLE: Thin solid electrolyte battery
INVENTOR(S): Ito, Shuji; Iwamoto, Kazuya; Ukaji, Masaya; Nanai, Norishige; Matsuda, Hiromu; Mino, Tatsuji; Honda, Kazuyoshi; Takai, Yoriko
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002352850	A	20021206	JP 2001-154955	200105 24

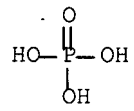
PRIORITY APPLN. INFO.: JP 2001-154955 200105 24

AB The battery has successive **layers** of a 1st collector, a first active mass, an electrolyte, a 2nd active mass and a 2nd collector connected to elec. conductors; where the **thickness** of the 1st active mass **layer** and the electrolyte **layer** is 1-20 and 1-10 μm, resp. Preferably, the collectors are orthogonal to the conductor, the electrolyte is (Li2S)x(Si S2)y(Li3PO4)z [(x+y+z)=1, x=0.3-0.8, y=0.2-0.7 and z=0.01-0.3], and the 1st or 2nd active mass is Li3-aMaN (0.2< a< 0.6; M= Co, Ni, Cu and/or Mn).

IT **10377-52-3**, Lithium phosphate (Li3PO4) **477704-33-9**
, Lithium nitride oxide phosphide (Li2.9N0.46O3.3P)
RL: DEV (Device component use); USES (Uses)
(compns. of solid electrolyte for thin secondary lithium batteries)

RN 10377-52-3 HCAPLUS

CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

RN 477704-33-9 HCAPLUS

CN Lithium nitride oxide phosphide (Li2.9N0.46O3.3P) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.46	17778-88-0
O	3.3	17778-80-2
P	1	7723-14-0
Li	2.9	7439-93-2

IC ICM H01M010-36
ICS H01M010-36; H01M002-26; H01M002-30; H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST thin battery solid electrolyte **lithium metal** nitride electrode

IT 10377-51-2, Lithium iodide (LiI) **10377-52-3**, Lithium phosphate (Li3PO4) 12136-58-2, Lithium sulfide (Li2S) 13759-10-9, Silicon sulfide (SiS2) 90076-65-6, Lithium bis(trifluoromethanesulfonyl) imide 201471-17-2, Lithium phosphate sulfide thiosilicate (Li1.29(PO4)0.01S0.27(SiS3)0.36) **477704-33-9**, Lithium nitride oxide phosphide (Li2.9N0.46O3.3P)
RL: DEV (Device component use); USES (Uses)
(compns. of solid electrolyte for thin secondary lithium batteries)

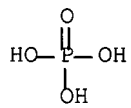
L18 ANSWER 6 OF 6 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:900301 HCAPLUS Full-text
DOCUMENT NUMBER: 136:22000
TITLE: Anode of lithium secondary battery
INVENTOR(S): Kugai, Hirokazu; Ota, Nobuhiro; Yamanaka, Shosaku

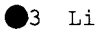
PATENT ASSIGNEE(S): Sumitomo Electric Industries, Ltd., Japan
SOURCE: Eur. Pat. Appl., 5 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1162675	A2	20011212	EP 2001-305020	200106 08
EP 1162675	A3	20040908		
EP 1162675	B1	20061004		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2001351615	A	20011221	JP 2000-172073	200006 08
US 2002018939	A1	20020214	US 2001-838182	200104 20
US 6699619	B2	20040302		
PRIORITY APPLN. INFO.:			JP 2000-172073 A	200006 08

AB A lithium-secondary-battery neg. electrode has a protective **layer** to prevent the surface deterioration of the inorg. solid electrolytic **layer**. The neg. electrode comprises **metallic lithium** or a **lithium**-containing **metal**, a first inorg. solid electrolytic **layer** (**thickness**: a) formed on the metal, and a second inorg. solid electrolytic **layer** (**thickness**: b) formed on the first inorg. solid electrolytic **layer**. The **thickness** ratio b/a is specified to be more than 0.5.

IT **10377-52-3**, Lithium phosphate
RL: DEV (Device component use); USES (Uses)
(anode of lithium secondary battery)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)





IC ICM H01M004-02
ICS H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 7439-93-2, Lithium, uses 7440-50-8, Copper, uses 10377-48-7, Lithium sulfate **10377-52-3**, Lithium phosphate 12136-58-2, Lithium sulfide 12190-79-3, Cobalt lithium oxide colio2 13453-84-4, Lithium silicate 13759-10-9, Silicon sulfide

sis2 21324-40-3, Lithium hexafluorophosphate 25014-41-9, Polyacrylonitrile 196418-93-6, Lithium phosphate silicide sulfide
RL: DEV (Device component use); USES (Uses)
(anode of lithium secondary battery)

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L19 ANSWER 1 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:337615 HCAPLUS Full-text
DOCUMENT NUMBER: 144:394637
TITLE: Solid electrolytes based on lithium hafnium phosphate for active metal anode protection
INVENTOR(S): Nimon, Yevgeniy S.; De Jonghe, Lutgard C.; Visco, Steven J.
PATENT ASSIGNEE(S): Polyplus Battery Company, USA
SOURCE: U.S. Pat. Appl. Publ., 16 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2006078790	A1	20060413	US 2005-245472	200510 05
PRIORITY APPLN. INFO.:			US 2004-616325P	P 200410 05

AB Active metal electrochem. structure, in particular an active metal neg. electrode (anode) protected with an ionically conductive protective architecture incorporating a glassy, ceramic or glass-ceramic solid electrolyte material based on lithium hafnium phosphate, and associated electrochem. devices and methods, provides advantages over conventional structures. The protective architecture prevents the active metal from deleterious reaction with the environment on the other (cathode) side of the architecture, which may include aqueous, air or organic liquid electrolytes and/or electrochem. active materials.

IT **7439-93-2D, Lithium**, alloys
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(active **metal** electrode; solid electrolytes based on lithium hafnium phosphate for active **metal** anode protection)

RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

Li

IT **7439-93-2**, Lithium, uses
RL: ANT (Analyte); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); USES (Uses)
(anodes and element in solid electrolyte; solid electrolytes based on lithium hafnium phosphate for active **metal**

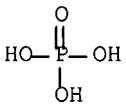
anode protection)
RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

Li

IT **7439-93-2D**, Lithium, inorg. compds. **10377-52-3**,
Lithium phosphate
RL: DEV (Device component use); USES (Uses)
(can be in conductive glass or ceramic electrolyte material;
solid electrolytes based on lithium hafnium phosphate for active
metal anode protection)
RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

Li

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



3 Li

IT **668998-68-3**, Lithium phosphorus nitride oxide (LiPNO)
RL: DEV (Device component use); USES (Uses)
(contacts anode; solid electrolytes based on lithium hafnium
phosphate for active metal anode protection)
RN 668998-68-3 HCAPLUS
CN Lithium phosphorus nitride oxide (LiPNO) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
O	1	17778-80-2
P	1	7723-14-0
Li	1	7439-93-2

INCL 429137000; 429246000; 429303000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72
ST solid electrolyte **lithium** hafnium phosphate **metal**
anode corrosion protection; glass ceramic glassy **lithium**
metal phosphate cathodic protective **layer**
IT Materials
(**layered**; solid electrolytes based on lithium hafnium

phosphate for active metal anode protection)

IT **7439-93-2D, Lithium**, alloys
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(active **metal** electrode; solid electrolytes based on lithium hafnium phosphate for active **metal** anode protection)

IT **7439-93-2**, Lithium, uses
RL: ANT (Analyte); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); USES (Uses)
(anodes and element in solid electrolyte; solid electrolytes based on lithium hafnium phosphate for active **metal** anode protection)

IT **7439-93-2D**, Lithium, inorg. compds. **10377-52-3**, Lithium phosphate 12057-24-8, Lithium oxide, uses 13774-56-6
RL: DEV (Device component use); USES (Uses)
(can be in conductive glass or ceramic electrolyte material; solid electrolytes based on lithium hafnium phosphate for active **metal** anode protection)

IT 7550-35-8, Lithium bromide 7789-24-4, Lithium fluoride, uses 10377-51-2, Lithium iodide 12057-29-3, Trilithium phosphide 26134-62-3, Trilithium nitride **668998-68-3**, Lithium phosphorus nitride oxide (LiPNO)
RL: DEV (Device component use); USES (Uses)
(contacts anode; solid electrolytes based on lithium hafnium phosphate for active metal anode protection)

L19 ANSWER 2 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:564516 HCAPLUS Full-text
DOCUMENT NUMBER: 143:81150
TITLE: Chemical protection of a lithium surface
INVENTOR(S): De Jonghe, Lutgard; Visco, Steven J.; Nimon, Yevgeniy S.; Sukeshini, A. Mary
PATENT ASSIGNEE(S): Polyplus Battery Co., USA
SOURCE: U.S., 16 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

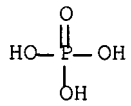
PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
US 6911280	B1	20050628	US 2002-327682		20021220
US 2005186469	A1	20050825	US 2005-92781		20050328
PRIORITY APPLN. INFO.:			US 2001-342326P	P	20011221
			US 2002-327682	A1	20021220

AB Disclosed are compns. and methods for alleviating the problem of reaction of lithium or other alkali or alkaline earth metals with incompatible processing and

operating environments by creating a ionically conductive chemical protective **layer** on the **lithium** or other reactive **metal** surface. Such a chemical produced surface **layer** can protect **lithium metal** from reacting with oxygen, nitrogen or moisture in ambient atmospheric thereby allowing the lithium material to be handled outside of a controlled atmospheric, such as a dry room. Production processes involving lithium are thereby very considerably simplified. One example of such a process in the processing of lithium to form neg. electrodes for **lithium metal** batteries.

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: DEV (Device component use); USES (Uses)
(glass; chemical protection of lithium surface)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M002-08
ICS H01M010-04; H01M010-26
INCL 429137000; 429246000; 429231900; 429231950; 429309000; 429319000; 429320000; 429321000; 429322000; 429126100
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 57
IT 7440-55-3, Gallium, uses **10377-52-3**, Lithium phosphate 12024-22-5, Gallium sulfide (Ga2S3) 12025-34-2, Germanium sulfide (GeS2) 12136-58-2, Lithium sulfide (Li2S) 13759-10-9, Silicon sulfide (SiS2) **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: DEV (Device component use); USES (Uses)
(glass; chemical protection of lithium surface)
REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 3 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:394639 HCAPLUS Full-text
DOCUMENT NUMBER: 142:449374
TITLE: Anode for **lithium metal** battery
INVENTOR(S): Kim, Hee-Tak; Choi, Su-Suk; Choi, Yun-Suk;

	Cheon, Sang-Eun; Han, Ji-Seong
PATENT ASSIGNEE(S):	S. Korea
SOURCE:	U.S. Pat. Appl. Publ., 16 pp.
	CODEN: USXXCO
DOCUMENT TYPE:	Patent
LANGUAGE:	English
FAMILY ACC. NUM. COUNT:	1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005095504	A1	20050505	US 2004-962636	20041011
KR 2005041661	A	20050504	KR 2003-76907	20031031
CN 1612377	A	20050504	CN 2004-10088239	20041021
JP 2005142156	A	20050602	JP 2004-318456	20041101

PRIORITY APPLN. INFO.:	KR 2003-76907	A	20031031

AB The present invention relates to a neg. electrode for a **lithium metal** battery and a **lithium metal** battery comprising the same. The neg. electrode of the present invention comprises a neg. active material **layer** of **metallic lithium** or a **lithium** alloy, and a passivation **layer** formed on the neg. active material **layer**. The passivation **layer** has a structure comprising a 3-dimensionally cross-linked polymer network matrix penetrated by linear polymers. The passivation **layer** formed on the surface of the neg. electrode reduces reactivity of the neg. electrode and stabilizes the surface, so that it offers a **lithium metal** battery having superior life cycle characteristics.

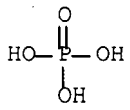
IT **7439-93-2**, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(anode for **lithium metal** battery)
RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

IT **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: MOA (Modifier or additive use); USES (Uses)
(anode for **lithium metal** battery)
RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0

Li | x | 7439-93-2

IT **10377-52-3**, Lithium phosphate
RL: TEM (Technical or engineered material use); USES (Uses)
(coating film; anode for **lithium metal** battery)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



3 Li

IC ICM H01M002-16
ICS B05D003-02
INCL 429246000; 429254000; 427388200
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST anode **lithium metal** battery
IT Battery anodes
(anode for **lithium metal** battery)
IT Fluoropolymers, uses
Polyacetylenes, uses
Polyamides, uses
Polycarbonates, uses
Polyesters, uses
Polyethers, uses
Polyimides, uses
Polysulfones, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(anode for **lithium metal** battery)
IT Polyacenes
RL: TEM (Technical or engineered material use); USES (Uses)
(coating film; anode for **lithium metal** battery)
IT Coating materials
(films; anode for **lithium metal** battery)
IT Secondary batteries
(**lithium**; anode for **lithium metal** battery)
IT Carboxylic acids, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polycarboxylic acid esters; anode for **lithium metal** battery)
IT Carboxylic acids, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polycarboxylic, salts; anode for **lithium metal** battery)
IT Polymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polysulfonates; anode for **lithium metal** battery)
IT Lithium alloy, base

RL: DEV (Device component use); USES (Uses)
(anode for **lithium metal** battery)

IT 78-67-1, Azobisisobutyronitrile 80-15-9, Cumyl hydroperoxide 94-36-0, Benzoyl peroxide, processes 110-05-4, Di-tert-butyl peroxide 110-22-5, Acetyl peroxide 2895-03-6, Lauryl peroxide 13472-08-7, 2,2'-Azobisisovaleronitrile
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(anode for **lithium metal** battery)

IT 111-96-6, Diglyme **7439-93-2**, Lithium, uses 10544-50-0, Sulfur S8, uses 90076-65-6
RL: DEV (Device component use); USES (Uses)
(anode for **lithium metal** battery)

IT 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 12047-24-4, Barium titanium oxide batio2 13463-67-7, Titania, uses 26134-62-3, Lithium nitride 148522-93-4, Barium oxide (Ba2O3) **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 236388-74-2, Lithium boride sulfide 851076-32-9, Lithium sulfur oxide
RL: MOA (Modifier or additive use); USES (Uses)
(anode for **lithium metal** battery)

IT 75-21-8D, Ethylene oxide, crosslinked polymers containing 9002-86-2, Polyvinyl chloride 9002-88-4, Polyethylene 9002-89-5, Polyvinyl alcohol 9003-07-0, Polypropylene 9003-53-6, Polystyrene 13048-33-4D, Hexanediol diacrylate, crosslinked polymers containing 24937-79-9, Polyvinylidene fluoride 35465-54-4D, crosslinked polymers containing 91528-71-1
RL: TEM (Technical or engineered material use); USES (Uses)
(anode for **lithium metal** battery)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-31-5, Tin, uses 7440-42-8, Boron, uses 7440-43-9, Cadmium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-55-3, Gallium, uses 7440-66-6, Zinc, uses 7440-74-6, Indium, uses **10377-52-3**, Lithium phosphate 12627-14-4, Lithium silicate 12676-27-6 25067-58-7, Polyacetylene 25190-62-9, Poly(p-phenylene) 25233-30-1, Polyaniline 25233-34-5, Polythiophene 26009-24-5, Poly(p-phenylene vinylene) 28774-98-3, Poly(2,6-naphthalenediyl) 30604-81-0, Polypyrrole 114239-80-4, Poly(perinaphthalene) 236388-75-3, Aluminum lithium sulfide 355408-23-0, Lithium nitride phosphide
RL: TEM (Technical or engineered material use); USES (Uses)
(coating film; anode for **lithium metal** battery)

L19 ANSWER 4 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:302682 HCAPLUS Full-text
DOCUMENT NUMBER: 142:376518
TITLE: Energy device and its manufacture
INVENTOR(S): Honda, Kazuyoshi; Okazaki, Sadayuki; Oishi, Koichiro; Takahashi, Makoto; Takai, Yoriko; Higuchi, Hiroshi
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005093373	A	20050407	JP 2003-328628	200309 19

PRIORITY APPLN. INFO.: JP 2003-328628 200309 19

AB The device, especially a secondary lithium battery, has a solid electrolyte **layer** and an anode active mass **layer** , containing **Li** and a 2nd **metal**; where the concentration of Li in the anode active **layer** is increased toward the interface of the electrolyte **layer** side. The device is manufactured by forming the required anode active mass **layer** on the solid electrolyte **layer** by vacuum thin-film process; where the process comprises: using a 1st thin film forming source for laminating Li and a 2nd thin film forming source for laminating the 2nd metal; and forming the anode **layer** by transporting the contribution of the thin-film forming from the 1st thin-film forming by the 1st film forming source to the 2nd thin-film forming by the 2nd film forming source.

IT **7439-93-2**, Lithium, uses **168886-50-8**, Lithium phosphorus oxide
RL: DEV (Device component use); USES (Uses)
(structure and manufacture of secondary lithium batteries containing lithium with controlled distribution and other **metals** in anode active mass **layers**)

RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

Li

RN 168886-50-8 HCAPLUS
CN Lithium phosphorus oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-02
ICS C22C024-00; H01M004-38; H01M010-36; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary lithium battery manuf anode active mass **lithium metal**
IT Secondary batteries
(lithium; structure and manufacture of secondary lithium batteries containing lithium with controlled distribution and other metals in anode active mass **layers**)
IT Battery anodes
(structure and manufacture of secondary lithium batteries containing lithium with controlled distribution and other metals in anode active mass **layers**)
IT 7429-90-5, Aluminum, uses **7439-93-2**, Lithium, uses 7440-02-0, Nickel, uses 52627-24-4, Cobalt lithium oxide

168886-50-8, Lithium phosphorus oxide
RL: DEV (Device component use); USES (Uses)
(structure and manufacture of secondary lithium batteries containing lithium with controlled distribution and other **metals** in anode active mass **layers**)

L19 ANSWER 5 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:1081208 HCAPLUS Full-text
DOCUMENT NUMBER: 142:41556
TITLE: Aliovalent anion protective **layers** for active metal anodes
INVENTOR(S): De Jonghe, Lutgard; Nimon, Yevgeniy S.; Visco, Steven J.
PATENT ASSIGNEE(S): Polyplus Battery Company, USA
SOURCE: PCT Int. Appl., 37 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004109823	A1	20041216	WO 2004-US17646	200406 04
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
US 2004253510	A1	20041216	US 2004-861336	200406 03
EP 1629552	A1	20060301	EP 2004-776270	200406 04
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK				

PRIORITY APPLN. INFO.:		
US 2003-476143P	P	200306 04
US 2003-482997P	P	200306 27
US 2004-861336	A	200406 03
WO 2004-US17646	W	

200406
04

AB Active metal anodes can be protected from deleterious reaction and voltage delay in an active metal anode-solid cathode battery cell, and damage to the anode can be significantly reduced or completely alleviated by coating the active **metal** anode (e.g., **Li**) surface with a thin **layer** of a chemical protective **layer** incorporating aliovalent (multivalent) anions on the **lithium metal** surface. Such an aliovalent surface **layer** is conductive to Li-ions but can protect **lithium metal** from reacting with oxygen, nitrogen or moisture in ambient atmospheric thereby allowing the lithium material to be handled outside of a controlled atmospheric, such as a dry room. Particularly, preferred examples of such protective **layers** include mixts. or solid solns. of lithium phosphate, lithium metaphosphate, and/or lithium sulfate. These protective **layers** can be formed on the Li surface by treatment with diluted solns. of the following acids: H3PO4, HPO3 and H2SO4 or their acidic salts in a dry organic solvent compatible with Li by various techniques. Such chemical protection of the **Li** or other active **metal** electrode significantly enhances active metal electrode protection and reduces the voltage delay due to protected anode's improved stability toward the electrolyte.

IT **7439-93-2**, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(aliovalent anion protective **layers** for active **metal** anodes)

RN 7439-93-2 HCAPLUS

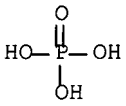
CN Lithium (CA INDEX NAME)

Li

IT **10377-52-3**, Lithium phosphate
RL: TEM (Technical or engineered material use); USES (Uses)
(protective **layer**; aliovalent anion protective **layers** for active metal anodes)

RN 10377-52-3 HCAPLUS

CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

IC ICM H01M004-04
ICS H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery anode aliovalent anion protective **layer** coating

IT Phosphates, uses
Sulfates, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(active metal; aliovalent anion protective **layers** for active metal anodes)

IT Battery anodes
Coating materials

(aliovalent anion protective **layers** for active metal anodes)

IT Alkali metals, uses
Alkaline earth metals
Oxides (inorganic), uses
Sulfides, uses
RL: DEV (Device component use); USES (Uses)
(aliovalent anion protective **layers** for active metal anodes)

IT Alloys, uses
RL: DEV (Device component use); USES (Uses)
(alkaline earth; aliovalent anion protective **layers** for active metal anodes)

IT Alloys, uses
RL: DEV (Device component use); USES (Uses)
(alkali metal; aliovalent anion protective **layers** for active metal anodes)

IT Alkali metals, uses
Alkaline earth metals
RL: DEV (Device component use); USES (Uses)
(alloys; aliovalent anion protective **layers** for active metal anodes)

IT Primary batteries
Secondary batteries
(lithium; aliovalent anion protective **layers** for active metal anodes)

IT Phosphates, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(metaphosphates, active metal; aliovalent anion protective **layers** for active metal anodes)

IT Halides
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(oxyhalides, liquid; aliovalent anion protective **layers** for active metal anodes)

IT 108-32-7, Propylene carbonate 110-71-4, 1,2-Dimethoxyethane 1313-13-9, Manganese dioxide, uses 1313-27-5, Molybdenum oxide (MoO3), uses 1317-37-9, Iron sulfide (FeS) 1317-38-0, Copper oxide (CuO), uses 1317-40-4, Copper sulfide (CuS) **7439-93-2**, Lithium, uses 7439-95-4, Magnesium, uses 7440-09-7, Potassium, uses 7440-23-5, Sodium, uses 7440-39-3, Barium, uses 7440-41-7, Beryllium, uses 7440-70-2, Calcium, uses 7704-34-9, Sulfur, uses 7719-09-7, Thionyl chloride 7784-01-2, Silver chromate 7791-03-9, Lithium perchlorate 11105-02-5, Silver vanadium oxide 12039-13-3, Titanium sulfide (TiS2) 12068-85-8, Iron sulfide (FeS2) 14283-07-9, Lithium tetrafluoroborate 15365-14-7, Iron lithium phosphate felipo4 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 39300-70-4, Lithium nickel oxide 39457-42-6, Lithium manganese oxide 52627-24-4, Cobalt lithium oxide 74432-42-1, Lithium polysulfide 90076-65-6, Litfsi
RL: DEV (Device component use); USES (Uses)
(aliovalent anion protective **layers** for active **metal** anodes)

IT 7664-93-9, Sulfuric acid, uses 13453-86-6, Lithium hydrogen sulfate
RL: MOA (Modifier or additive use); USES (Uses)
(aliovalent anion protective **layers** for active metal anodes)

IT 7664-38-2, Phosphoric acid, uses 10343-62-1, MetaPhosphoric acid

14066-19-4, Hydrogen phosphate, uses 14066-20-7, Dihydrogen phosphate, uses
RL: MOA (Modifier or additive use); USES (Uses)
(film forming additive; aliovalent anion protective **layers** for active metal anodes)
IT 10377-48-7, Lithium sulfate **10377-52-3**, Lithium phosphate
RL: TEM (Technical or engineered material use); USES (Uses)
(protective **layer**; aliovalent anion protective **layers** for active metal anodes)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 6 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:1060620 HCAPLUS Full-text
DOCUMENT NUMBER: 142:25936
TITLE: Alleviation of voltage delay in lithium-liquid depolarizer/electrolyte solvent battery cells
INVENTOR(S): De Jonghe, Lutgard; Nimon, Yevgeniy S.; Visco, Steven J.
PATENT ASSIGNEE(S): Polyplus Battery Company, USA
SOURCE: U.S. Pat. Appl. Publ., 12 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004248009	A1	20041209	US 2003-455259	20030604
WO 2004109826	A2	20041216	WO 2004-US18173	20040603
WO 2004109826	A3	20050224		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
EP 1629555	A2	20060301	EP 2004-754704	20040603
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK				

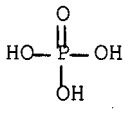
PRIORITY APPLN. INFO.: US 2003-455259 A 20030604
WO 2004-US18173 W

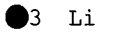
200406
03

AB Voltage delay in an active metal anode/liquid cathode battery cell can be significantly reduced or completely alleviated by coating the active **metal** anode (e.g., **Li**) surface with a thin **layer** of an inorg. compound with Li-ion conductivity using chemical treatment of Li surface. Particularly, preferred examples of such compds. include lithium phosphate, lithium metaphosphate, and/or their mixts. or solid solns. with lithium sulfate. These compds. can be formed on the Li surface by treatment with diluted solns. of the following individual acids: H3PO4, HPO3 and H2SO4, their acidic salts, or their binary or ternary mixts. in a dry organic solvent compatible with Li, for instance in 1,2-DME; by various deposition techniques. Such chemical protection of the **Li** or other active **metal** electrode significantly reduces the voltage delay due to protected anode's improved stability toward the electrolyte.

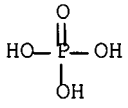
IT **10377-52-3**, Lithium phosphate **13453-80-0**, Lithium dihydrogen phosphate **13762-75-9**, Lithium metaphosphate **33943-39-4**, DiLithium hydrogen phosphate
RL: MOA (Modifier or additive use); USES (Uses)
(film-forming additive; alleviation of voltage delay in lithium-liquid depolarizer/electrolyte solvent battery cells)

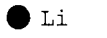
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



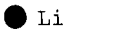


RN 13453-80-0 HCAPLUS
CN Phosphoric acid, lithium salt (1:1) (CA INDEX NAME)

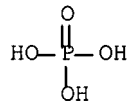




RN 13762-75-9 HCAPLUS
CN Metaphosphoric acid (HPO3), lithium salt (8CI, 9CI) (CA INDEX NAME)



ONE OR MORE TAUTOMERIC DOUBLE BONDS NOT DISPLAYED IN THE STRUCTURE
RN 33943-39-4 HCAPLUS
CN Phosphoric acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M004-58
ICS H01M006-00; H01M006-18; H01M010-00
INCL 429231600; 429231900; 429231950; 429321000; 429322000; 429323000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72
IT 7664-38-2, Phosphoric acid, uses 10343-62-1, Metaphosphoric acid 10377-48-7, Lithium sulfate **10377-52-3**, Lithium phosphate **13453-80-0**, Lithium dihydrogen phosphate 13453-86-6, Lithium hydrogen sulfate **13762-75-9**, Lithium metaphosphate **33943-39-4**, DiLithium hydrogen phosphate
RL: MOA (Modifier or additive use); USES (Uses)
(film-forming additive; alleviation of voltage delay in lithium-liquid depolarizer/electrolyte solvent battery cells)

L19 ANSWER 7 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:960418 HCAPLUS Full-text
DOCUMENT NUMBER: 141:382194
TITLE: Cathode containing **lithium** transition **metal** mixed oxide for secondary nonaqueous-electrolyte battery
INVENTOR(S): Hosoya, Yosuke; Yamamoto, Yoshikatsu
PATENT ASSIGNEE(S): Sony Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004319129	A	20041111	JP 2003-108070	20030411
KR 2004089514	A	20041021	KR 2004-24339	20040409
US 2004253518	A1	20041216	US 2004-821589	20040409
CN 1571197	A	20050126	CN 2004-10071490	20040412

PRIORITY APPLN. INFO.: JP 2003-108070 A

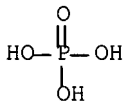
200304
11

AB The claimed cathode active mass contains **layered**-structure **lithium** transition **metal** mixed oxide particles having a coating containing an inorg. compound and a C material at least a part of their surfaces. The resulting battery provides high electron conductivity and discharge capacity after repeated charging-discharging under high temperature

IT **10377-52-3**, Lithium phosphate (Li3PO4)
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(coating containing inorg. compound and carbon on **lithium** transition **metal** mixed oxide cathode for battery)

RN 10377-52-3 HCAPLUS

CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



IC ICM H01M004-58
ICS H01M004-02; H01M004-62; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **lithium** transition **metal** oxide cathode carbon coating secondary battery

IT Battery cathodes
(coating containing inorg. compound and carbon on **lithium** transition **metal** mixed oxide cathode for battery)

IT Carbon black, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(coating containing inorg. compound and carbon on **lithium** transition **metal** mixed oxide cathode for battery)

IT Secondary batteries
(lithium; coating containing inorg. compound and carbon on **lithium** transition **metal** mixed oxide cathode for battery)

IT 12031-65-1, Lithium nickel oxide (LiNiO2)
RL: DEV (Device component use); USES (Uses)
(cathode; coating containing inorg. compound and carbon on **lithium** transition **metal** mixed oxide cathode for battery)

IT 1309-48-4, Magnesia, uses 1344-28-1, Alumina, uses **10377-52-3**, Lithium phosphate (Li3PO4) 12003-67-7, Aluminum lithium oxide (AlLiO2) 12031-95-7, Lithium titanium oxide (Li4Ti5O12) 13463-67-7, Titania, uses 15365-14-7, Iron lithium phosphate (FeLiPO4)
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(coating containing inorg. compound and carbon on **lithium** transition **metal** mixed oxide cathode for battery)

L19 ANSWER 8 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

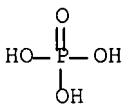
ACCESSION NUMBER: 2004:584868 HCAPLUS Full-text
DOCUMENT NUMBER: 141:126310
TITLE: Solid secondary lithium batteries showing high charge-discharge current density
INVENTOR(S): Kondo, Shigeo; Kurisu, Yasuyuki; Kageyama, Hiroyuki; Takeuchi, Tomonari; Kanno, Ryoji; Inada, Taro
PATENT ASSIGNEE(S): Ion Engineering Center Corp., Japan; National Institute of Advanced Industrial Science and Technology
SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004206942	A	20040722	JP 2002-372272	200212 24

PRIORITY APPLN. INFO.: JP 2002-372272 200212 24

AB In the batteries, solid electrolytes comprise first low-ionic-conductivity **layers** reactive to Li, and second **layers** unreactive to the first **layers** and preformed on surfaces of **Li metal** anodes. Preferably, the first **layers** comprise crystalline and/or amorphous Li ion conductive sulfides, and the second **layers** comprise Li ion conductive thin films chosen from Li3N, LiI, LiF, SOCl2-Li reaction product, Li sulfite, and LiPF6.

IT **10377-52-3**, Lithium phosphate
RL: DEV (Device component use); USES (Uses)
(glass with Li2S and SiS2, first solid electrolyte **layer** ; solid secondary lithium batteries using solid electrolytes comprising first low-ionic-conductivity **layers** reactive to Li and second **layers** unreactive to the first **layers**)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



IC ICM H01M010-36
ICS H01M004-02; H01M004-40; H01M004-62
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST two **layer** solid electrolyte lithium battery; battery electrolyte lithium silicon phosphate sulfide glass; lithium nitride solid electrolyte battery

IT Sulfide glasses
RL: DEV (Device component use); USES (Uses)
(lithium silicon phosphate sulfide, first solid electrolyte **layers**; solid secondary lithium batteries using solid electrolytes comprising first low-ionic-conductivity **layers** reactive to Li and second **layers** unreactive to the first **layers**)

IT Secondary batteries
(lithium; solid secondary lithium batteries using solid electrolytes comprising first low-ionic-conductivity **layers** reactive to Li and second **layers** unreactive to the first **layers**)

IT Battery electrolytes
Solid electrolytes
(solid secondary lithium batteries using solid electrolytes comprising first low-ionic-conductivity **layers** reactive to Li and second **layers** unreactive to the first **layers**)

IT 361393-39-7
RL: DEV (Device component use); USES (Uses)
(crystalline, first solid electrolyte **layer**; solid secondary lithium batteries using solid electrolytes comprising first low-ionic-conductivity **layers** reactive to Li and second **layers** unreactive to the first **layers**)

IT 13759-10-9, Silicon sulfide (SiS2)
RL: DEV (Device component use); USES (Uses)
(glass with Li2S and Li3PO4, first solid electrolyte **layer**; solid secondary lithium batteries using solid electrolytes comprising first low-ionic-conductivity **layers** reactive to Li and second **layers** unreactive to the first **layers**)

IT **10377-52-3**, Lithium phosphate
RL: DEV (Device component use); USES (Uses)
(glass with Li2S and SiS2, first solid electrolyte **layer** ; solid secondary lithium batteries using solid electrolytes comprising first low-ionic-conductivity **layers** reactive to Li and second **layers** unreactive to the first **layers**)

IT 12136-58-2, Lithium sulfide
RL: DEV (Device component use); USES (Uses)
(glass with SiS2 and Li3PO4, first solid electrolyte **layer**; solid secondary lithium batteries using solid electrolytes comprising first low-ionic-conductivity **layers** reactive to Li and second **layers** unreactive to the first **layers**)

IT 7439-93-2DP, Lithium, reaction product with thionyl chloride
7719-09-7DP, Thionyl chloride, reaction product with lithium
7789-24-4P, Lithium fluoride, uses 10377-51-2P, Lithium iodide
13308-35-5P 26134-62-3P, Lithium nitride
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(second solid electrolyte **layer**; solid secondary lithium batteries using solid electrolytes comprising first low-ionic-conductivity **layers** reactive to Li and second **layers** unreactive to the first **layers**)

IT 21324-40-3P, Lithium hexafluorophosphate
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(solid secondary lithium batteries using solid electrolytes comprising first low-ionic-conductivity **layers** reactive to Li

and second **layers** unreactive to the first **layers**)

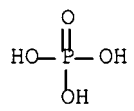
L19 ANSWER 9 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:466937 HCAPLUS Full-text
DOCUMENT NUMBER: 141:9653
TITLE: Negative electrode having lithium ion conductive inorganic compound **layer**, lithium secondary battery with improved cycle characteristic, and manufacture thereof
INVENTOR(S): Konishiike, Isamu; Yasuda, Toshikazu; Kubota, Tadahiko
PATENT ASSIGNEE(S): Sony Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004165097	A	20040610	JP 2002-332421	200211 15

PRIORITY APPLN. INFO.: JP 2002-332421 200211 15

AB Disclosed is the neg. electrode comprising a neg. electrode current collector, a **metal Li layer** formed on the current collector using a dry film forming method, and an inorg. compound **layer** on the **metal Li layer** which has a Li+ conductivity ≥1 + 10-8 S/cm at room temperature and is formed in vacuum ≤10 Pa using a dry film forming method. The use of the inorg. compound **layer** prevented an increase of the internal impedance.

IT **10377-52-3**, Lithium phosphate
RL: DEV (Device component use); USES (Uses)
(neg. electrode having lithium ion conductive inorg. compound **layer** in lithium secondary battery with improved cycle characteristic)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

IC ICM H01M004-02
ICS H01M004-40; H01M004-64; H01M004-66; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST neg electrode lithium ion secondary battery inorg compd **layer**

IT Secondary batteries
(lithium; neg. electrode having lithium ion conductive inorg. compound **layer** in lithium secondary battery with improved cycle characteristic)
IT Battery electrodes
(neg. electrode having lithium ion conductive inorg. compound **layer** in lithium secondary battery with improved cycle characteristic)
IT 554-13-2, Lithium carbonate 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-50-8, Copper, uses 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7789-24-4, Lithium fluoride, uses 10102-24-6, Lithium silicate 10377-48-7, Lithium sulfate 10377-51-2, Lithium iodide **10377-52-3**, Lithium phosphate 12057-24-8, Lithium oxide, uses 12136-58-2, Lithium sulfide 26134-62-3, Lithium nitride 138709-72-5, Lithium phosphide
RL: DEV (Device component use); USES (Uses)
(neg. electrode having lithium ion conductive inorg. compound **layer** in lithium secondary battery with improved cycle characteristic)

L19 ANSWER 10 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:310725 HCAPLUS Full-text
DOCUMENT NUMBER: 140:324230
TITLE: **Lithium metal** anode for **lithium** battery
INVENTOR(S): Cho, Chung-Kun; Lee, Sang-Mock; Lee, Jong-Ki; Kim, Min-Seuk
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: U.S. Pat. Appl. Publ., 5 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004072066	A1	20040415	US 2003-389752	20030318
KR 2004035909	A	20040430	KR 2002-62256	20021012
CN 1489229	A	20040414	CN 2003-120528	20030313
JP 2004134403	A	20040430	JP 2003-349215	20031008
JP 3787564	B2	20060621		
PRIORITY APPLN. INFO.:			KR 2002-62256 A	20021012

AB Provided is a **lithium metal** anode having a **lithium metal layer** and a porous polymer film integrated with a surface of the **lithium metal layer**. The **lithium metal**

anode further includes a current collector attached to the surface of the **lithium metal layer** opposite the porous polymer film. The **lithium metal** anode further includes a protective coating **layer** between the porous polymer film and the **lithium metal layer**, the protective coating **layer** having lithium ionic conductivity and impermeable to an electrolyte.

IT **7439-93-2, Lithium**, uses **7439-93-2D, Lithium**, salt **10377-52-3, Lithium** phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: DEV (Device component use); USES (Uses)
(**lithium metal** anode for **lithium** battery)

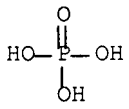
RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

Li

RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

Li

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M002-16
ICS H01M002-18; H01M004-40; H01M010-04
INCL 429137000; 429231950; 429246000; 029623200
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST **lithium metal** anode battery
IT Polyoxyalkylenes, uses
Polysiloxanes, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(**layer**; **lithium metal** anode for **lithium** battery)

IT Battery anodes
Coating materials
(**lithium metal** anode for **lithium** battery)

IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**lithium metal** anode for **lithium** battery)

IT Secondary batteries
(**lithium**; **lithium metal** anode for **lithium** battery)

IT Ethers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polycyclic, fluoro-; **lithium metal** anode for **lithium** battery)

IT Energy-rich phosphates
RL: TEM (Technical or engineered material use); USES (Uses)
(polymers; **lithium metal** anode for **lithium** battery)

IT 7440-02-0, Nickel, uses 7440-50-8, Copper, uses
RL: DEV (Device component use); USES (Uses)
(current collector; **lithium metal** anode for **lithium** battery)

IT 9002-88-4, Polyethylene 9003-07-0, Polypropylene
RL: TEM (Technical or engineered material use); USES (Uses)
(film; **lithium metal** anode for **lithium** battery)

IT 25322-68-3, Peo 49717-87-5, 2-Propenoic acid, ion(1-) homopolymer, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**layer**; **lithium metal** anode for **lithium** battery)

IT 110-71-4 111-96-6, Diglyme 126-33-0, Sulfolane 646-06-0, Dioxolane **7439-93-2**, **Lithium**, uses
7439-93-2D, **Lithium**, salt **10377-52-3**, **Lithium** phosphate 12627-14-4, **Lithium** silicate 12676-27-6 26134-62-3, **Lithium** nitride 33454-82-9, **Lithium** triflate 37220-89-6, **Lithium** aluminate 39302-37-9, **Lithium** titanium oxide 152747-89-2, Lanthanum **lithium** oxide **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, **Lithium** silicide sulfide 236388-74-2, **Lithium** boride sulfide 236388-75-3, Aluminum **lithium** sulfide 236388-76-4, **Lithium** phosphide sulfide 342379-43-5, Germanium **lithium** sulfide
RL: DEV (Device component use); USES (Uses)
(**lithium metal** anode for **lithium** battery)

IT 9002-84-0, Ptfe 9011-14-7, Pmma 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 24937-79-9, Pvdf 25014-41-9, Polyacrylonitrile 25067-11-2, Hexafluoropropylene-tetrafluoroethylene copolymer 59947-24-9, Polychlorofluoroethylene
RL: TEM (Technical or engineered material use); USES (Uses)
(**lithium metal** anode for **lithium** battery)

L19 ANSWER 11 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

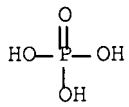
ACCESSION NUMBER: 2003:769061 HCAPLUS Full-text
DOCUMENT NUMBER: 139:281311
TITLE: Metallization of dental ceramic restorations
INVENTOR(S): Prasad, Arun
PATENT ASSIGNEE(S): Jeneric/Pentron Incorporated, USA
SOURCE: U.S., 5 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6627248	B1	20030930	US 2000-710051	200011 10

PRIORITY APPLN. INFO.: US 2000-710051 200011 10

AB A dental restoration comprises a ceramic core material having a thin metallic **layer** disposed on the interior surface of the ceramic core to provide integrity to the ceramic core, eliminate bonding between the ceramic core and the patient's tooth or teeth, and provide an impervious **layer** on the ceramic interior to reduce infiltration of fluids into the ceramic and reduce cracking of the ceramic restoration. The ceramic core material comprises one or more of glass-ceramic, alumina, zirconia, mullite, spinel, porcelain, titania, lithium disilicate, leucite, amorphous glass, and lithium phosphate. The metal in the metal matrix is selected from gold, silver, platinum group metals, titanium, tin, indium, gallium, and antimony. The metallic **layer** may comprise a metal, alloy or metal-matrix ceramic material. A strong, crack-resistant ceramic restoration is provided having highly aesthetic properties.

IT **10377-52-3, Lithium** phosphate
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(**metalization** of dental ceramic restorations by electrodeposition of metals and alloys)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



IC ICM A61C013-09
INCL 427002260; 427002290; 427205000; 433201100; 433202100
CC 63-7 (Pharmaceuticals)
Section cross-reference(s): 57
IT 1302-34-7, Leucite 1302-67-6, Spinel 1302-93-8, Mullite 1314-23-4, Zirconia, biological studies 1344-28-1, Alumina, biological studies 7440-22-4, Silver, biological studies 7440-31-5, Tin, biological studies 7440-32-6, Titanium, biological

studies 7440-36-0, Antimony, biological studies 7440-55-3, Gallium, biological studies 7440-57-5, Gold, biological studies 7440-74-6, Indium, biological studies 10102-24-6, **Lithium** silicate **10377-52-3**, **Lithium** phosphate 13463-67-7, Titania, biological studies
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(**metalization** of dental ceramic restorations by electrodeposition of metals and alloys)

REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 12 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:502703 HCAPLUS Full-text
DOCUMENT NUMBER: 137:65723
TITLE: **Layered** arrangements of lithium anodes for batteries
INVENTOR(S): Chu, May-Ying; Visco, Steven J.; Dejonghe, Lutgard C.
PATENT ASSIGNEE(S): Polyplus Battery Company, USA
SOURCE: U.S., 25 pp., Cont.-in-part of U.S. Ser. No. 431,190.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6413285	B1	20020702	US 2000-640467	200008 16
US 6413284	B1	20020702	US 1999-431190	199911 01
CA 2387796	A1	20010510	CA 2000-2387796	200010 27
WO 2001033651	A1	20010510	WO 2000-US29732	200010 27
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1230694	A1	20020814	EP 2000-973968	200010 27
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
BR 2000015111	A	20021126	BR 2000-15111	200010 27

JP 2003529895	T	20031007	JP 2001-535247	200010 27
AU 779944	B2	20050217	AU 2001-12407	200010 27
WO 2002015301	A2	20020221	WO 2001-US24342	200108 02
WO 2002015301	A3	20020926		
WO 2002015301	A9	20030403		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW

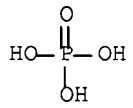
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

AU 2001081022	A5	20020225	AU 2001-81022	200108 02
US 2002034688	A1	20020321	US 2001-999673	200110 30
US 6737197	B2	20040518		
PRIORITY APPLN. INFO.:			US 1999-431190 A2	199911 01
			US 2000-640467 A	200008 16
			WO 2000-US29732 W	200010 27
			WO 2001-US24342 W	200108 02

AB A method employing a bonding **layer** is used to form active metal electrodes having barrier **layers**. Active **metals** such as **lithium** are highly reactive in ambient conditions. The method involves fabricating a lithium electrode or other active metal electrode without depositing the barrier **layer** on a **layer** of metal. Rather a smooth barrier **layer** is formed on a smooth substrate such as a web carrier or polymeric electrolyte. A bonding or alloying **layer** is formed on top of the barrier **layer**. Lithium or other active material is then attached to the bonding **layer** to form the active metal electrode. A current collector may also be attached to the **lithium** or active **metal** during the process.

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(glass, barrier **layer**; **layered** arrangements of lithium anodes for batteries)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-04
ICS H01M004-36
INCL 029623400
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST battery lithium anode **layered** arrangement
IT Glass, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(barrier **layer**; **layered** arrangements of lithium anodes for batteries)
IT Vapor deposition process
(chemical; **layered** arrangements of lithium anodes for batteries)
IT Battery anodes
Battery electrolytes
Ionic conductivity
(**layered** arrangements of lithium anodes for batteries)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)
IT Polyethers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)
IT Polymer blends
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)
IT Polyphosphazenes
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)
IT Polythioethers
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)
IT Primary batteries
(lithium; **layered** arrangements of lithium anodes for batteries)
IT Vapor deposition process
(phys.; **layered** arrangements of lithium anodes for batteries)

IT Imines
RL: TEM (Technical or engineered material use); USES (Uses)
(polyimines; **layered** arrangements of lithium anodes for batteries)
IT Polymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(releasable web carrier; **layered** arrangements of lithium anodes for batteries)
IT Polyesters, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; **layered** arrangements of lithium anodes for batteries)
IT Aluminum alloy, base
RL: TEM (Technical or engineered material use); USES (Uses)
(foil bonding **layer**; **layered** arrangements of lithium anodes for batteries)
IT Lithium alloy, base
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)
IT 7439-92-1, Lead, uses 7439-93-2, Lithium, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-32-6, Titanium, uses 7440-36-0, Antimony, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(foil bonding **layer**; **layered** arrangements of lithium anodes for batteries)
IT **10377-52-3**, Lithium phosphate 12627-14-4, Lithium silicate 12676-27-6 37220-89-6, Lithium aluminate **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 236388-74-2, Lithium boride sulfide 236388-75-3, Aluminum lithium sulfide 236388-76-4, Lithium phosphide sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(glass, barrier **layer**; **layered** arrangements of lithium anodes for batteries)
IT 12798-95-7
RL: DEV (Device component use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)
IT 12597-68-1, Stainless steel, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for batteries)
IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7440-31-5, Tin, uses 7440-50-8, Copper, uses 7440-66-6, Zinc, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(releasable web carrier; **layered** arrangements of lithium anodes for batteries)
IT 25038-59-9, Polyethylene terephthalate, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; **layered** arrangements of lithium anodes for batteries)
REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 13 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:143080 HCAPLUS Full-text
DOCUMENT NUMBER: 136:186681
TITLE: **Layered** arrangements of lithium anodes for lithium-sulfur batteries
INVENTOR(S): Chu, May-Ying; Visco, Steven J.; Dejonghe, Lutgard C.

PATENT ASSIGNEE(S): Polyplus Battery Company, USA
SOURCE: PCT Int. Appl., 51 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

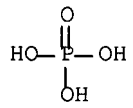
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002015301	A2	20020221	WO 2001-US24342	200108 02
WO 2002015301	A3	20020926		
WO 2002015301	A9	20030403		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
US 6413285	B1	20020702	US 2000-640467	200008 16
AU 2001081022	A5	20020225	AU 2001-81022	200108 02

PRIORITY APPLN. INFO.:		
US 2000-640467	A	200008 16
US 1999-431190	A2	199911 01
WO 2001-US24342	W	200108 02

AB A method employing a bonding **layer** is used to form active metal electrodes having barrier **layers**. Active **metals** such as **lithium** are highly reactive in ambient conditions. The method involves fabricating a lithium electrode or other active metal electrode without depositing the barrier **layer** on a **layer** of metal. Rather a smooth barrier **layer** is formed on a smooth substrate such as a web carrier or polymeric electrolyte. A bonding or alloying **layer** is formed on top of the barrier **layer**. Lithium or other active material is then attached to the bonding **layer** to form the active metal electrode. A current collector may also be attached to the **lithium** or active **metal** during the process.

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(releasable web carrier **layer; layered** arrangements of lithium anodes for lithium-sulfur batteries)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium sulfur battery anode **layered** arrangement
IT Vapor deposition process
(chemical; **layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Battery anodes
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Polyethers, uses
Polymer blends
Polyoxyalkylenes, uses
Polyphosphazenes
Polythioethers
RL: DEV (Device component use); USES (Uses)
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Polyesters, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Sulfide glasses
RL: TEM (Technical or engineered material use); USES (Uses)
(lithium borosulfide, releasable web carrier **layer**; **layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Sulfide glasses
RL: TEM (Technical or engineered material use); USES (Uses)
(lithium silicon sulfide, releasable web carrier **layer**; **layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Primary batteries
(lithium; **layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Vapor deposition process
(phys.; **layered** arrangements of lithium anodes for lithium-sulfur batteries)

IT Imines
RL: DEV (Device component use); USES (Uses)
(polyimines; **layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Glass, uses
Polymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(releasable web carrier **layer**; **layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Aluminum alloy, base
Titanium alloy, base
RL: TEM (Technical or engineered material use); USES (Uses)
(foil bonding **layer**; **layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT Lithium alloy, base
RL: DEV (Device component use); USES (Uses)
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT 7439-96-5, Manganese, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-36-0, Antimony, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(foil bonding **layer**; **layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT 12798-95-7
RL: DEV (Device component use); FMU (Formation, unclassified); FORM (Formation, nonpreparative); USES (Uses)
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT 25038-59-9, Polyethylene terephthalate, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**layered** arrangements of lithium anodes for lithium-sulfur batteries)
IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7440-31-5, Tin, uses 7440-50-8, Copper, uses 7440-66-6, Zinc, uses **10377-52-3**, Lithium phosphate 12627-14-4, Lithium silicate 12676-27-6 37220-89-6, Lithium aluminate **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-75-3, Aluminum lithium sulfide 236388-76-4, Lithium phosphide sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(releasable web carrier **layer**; **layered** arrangements of lithium anodes for lithium-sulfur batteries)

L19 ANSWER 14 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:717361 HCAPLUS Full-text
DOCUMENT NUMBER: 135:259557
TITLE: Composite materials for sliding parts
INVENTOR(S): Tsutsui, Hideyuki; Egami, Masaki
PATENT ASSIGNEE(S): NTN Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

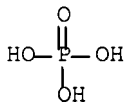
JP 2001271083	A	20011002	JP 2000-88949	200003 28
PRIORITY APPLN. INFO.:			JP 2000-88949	200003 28

AB The composite materials have a metal substrate, a porous metal **layer** on a the substrate, and a lubricating resin mixture impregnated in the porous **layer**; where resin mixture contains Li3PO4 additive in polytetrafluoroethylene. The mixture may also contain Li2CO3, p-aramid, and/or aramid containing dispersed SiO2.

IT **10377-52-3, Lithium** phosphate
RL: TEM (Technical or engineered material use); USES (Uses)
(**metal** sliding parts with polytetrafluoroethylene-lithium phosphate mixture impregnated porous metal surface **layers**)

RN 10377-52-3 HCAPLUS

CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



3 Li

IC ICM C10M169-04
ICS C08K003-26; C08K003-32; C08K003-36; C08L027-18; C10M107-38; C10M125-10; C10M125-24; C10M125-26; C10M149-18; F16C033-20; C10N010-02; C10N010-04; C10N020-06; C10N030-06; C10N040-02

CC 51-8 (Fossil Fuels, Derivatives, and Related Products)

IT Polyamide fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(aramid, para-; metal sliding parts with polytetrafluoroethylene-lithium phosphate mixture impregnated porous metal surface **layers**)

IT Crystal whiskers
(calcium carbonate; metal sliding parts with polytetrafluoroethylene-lithium phosphate mixture impregnated porous metal surface **layers**)

IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(metal sliding parts with polytetrafluoroethylene-lithium phosphate mixture impregnated porous metal surface **layers**)

IT Bearings
(sliding parts with polytetrafluoroethylene-lithium phosphate mixture impregnated porous metal surface **layers** for bearings)

IT 554-13-2, **Lithium** carbonate 7631-86-9, Silica, uses
9002-84-0, Polytetrafluoroethylene **10377-52-3, Lithium** phosphate 11109-50-5, sus 304
RL: TEM (Technical or engineered material use); USES (Uses)
(**metal** sliding parts with polytetrafluoroethylene-

lithium phosphate mixture impregnated porous metal surface **layers**)

IT 471-34-1, Calcium carbonate, uses
RL: TEM (Technical or engineered material use); USES (Uses) (whiskers; metal sliding parts with polytetrafluoroethylene-lithium phosphate mixture impregnated porous metal surface **layers**)

L19 ANSWER 15 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:397240 HCAPLUS Full-text
DOCUMENT NUMBER: 135:7792
TITLE: Lithium anodes for electrochemical cells
INVENTOR(S): Skotheim, Terje A.; Sheehan, Christopher J.; Mikhaylik, Yuriy V.
PATENT ASSIGNEE(S): Moltech Corporation, USA
SOURCE: PCT Int. Appl., 41 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

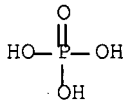
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001039303	A1	20010531	WO 2000-US32234	200011 21
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
AU 2001017967	A5	20010604	AU 2001-17967	200011 21
EP 1234348	A1	20020828	EP 2000-980746	200011 21
EP 1234348	B1	20031022		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
JP 2003515893	T	20030507	JP 2001-540870	200011 21
CN 1728418	A	20060201	CN 2005-10079023	200011 21
PRIORITY APPLN. INFO.:			US 1999-167171P P	199911 23
			CN 2000-818169 A3	200011 21

WO 2000-US32234 W
200011
21

AB Provided are lithium anodes for use in electrochem. cells, where the anode active **layer** has a first **layer** comprising **lithium metal** and a second **layer** of a temporary protective material, wherein the temporary protective material is a metal capable of forming an alloy with **lithium metal** or is capable of diffusing into **lithium metal**. The present invention also pertains to methods of forming such anodes, electrochem. cells comprising such anodes, and methods of making such cells.

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(lithium anodes for electrochem. cells)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT **10377-52-3**, Lithium phosphate 11115-95-0, Lithium niobium oxide 12627-14-4, Lithium silicate 12674-25-8, Germanium lithium oxide 17372-42-8 25038-59-9, Polyethylene terephthalate, uses 37220-89-6, Lithium aluminate 152747-89-2, Lanthanum lithium oxide **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 342379-43-5, Germanium lithium sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(lithium anodes for electrochem. cells)

IT 7429-90-5, Aluminum, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses 7440-06-4, Platinum, uses 7440-22-4, Silver, uses 7440-31-5, Tin, uses 7440-43-9, Cadmium, uses 7440-50-8, Copper, uses 7440-55-3, Gallium, uses 7440-56-4, Germanium, uses 7440-57-5, Gold, uses 7440-66-6, Zinc, uses 7440-69-9, Bismuth, uses 7440-74-6, Indium, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(temporary protective **metal**; **lithium** anodes for electrochem. cells)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 16 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:397239 HCAPLUS Full-text
DOCUMENT NUMBER: 135:7791
TITLE: Lithium anodes for electrochemical cells
INVENTOR(S): Skotheim, Terje A.; Sheehan, Christopher J.; Mikhaylik, Yuriy V.; Affinito, John
PATENT ASSIGNEE(S): Moltech Corporation, USA
SOURCE: PCT Int. Appl., 39 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

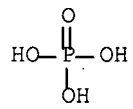
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001039302	A1	20010531	WO 2000-US32232	200011 21
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
AU 2001016286	A5	20010604	AU 2001-16286	200011 21
EP 1236231	A1	20020904	EP 2000-978872	200011 21
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2003515892	T	20030507	JP 2001-540869	200011 21
CN 1728418	A	20060201	CN 2005-10079023	200011 21

PRIORITY APPLN. INFO.:		
US 1999-167171P	P	199911 23
CN 2000-818169	A3	200011 21
WO 2000-US32232	W	200011 21

AB Provided is an anode for use in electrochem. cells, wherein the anode active **layer** has a first **layer** comprising **lithium metal** and a multi-**layer** structure comprising single ion conducting **layers** and crosslinked polymer **layers** in contact with the first **layer** comprising **lithium metal** or in contact with an intermediate protective **layer**, such as a temporary protective metal **layer**, or plasma CO2 treatment **layers** on the surface of the lithium-containing first **layer**. The anodes of the current invention are particularly useful in electrochem. cells comprising sulfur-containing cathode active materials, such as elemental sulfur.

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(glass; lithium anodes for electrochem. cells)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



3 Li

RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

IT **10377-52-3**, Lithium phosphate 11115-95-0, Lithium niobium oxide 12627-14-4, Lithium silicate 12676-27-6 12769-51-6, Lithium tantalum oxide 37220-89-6, Lithium aluminate 39302-37-9, Lithium titanium oxide 152747-89-2, Lanthanum lithium oxide **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 236388-74-2, Lithium boride sulfide 236388-75-3, Aluminum lithium sulfide 236388-76-4, Lithium phosphide sulfide 342379-43-5, Germanium lithium sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(glass; lithium anodes for electrochem. cells)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 17 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:359752 HCAPLUS Full-text
DOCUMENT NUMBER: 134:357615
TITLE: Metallization of ceramic restorations
INVENTOR(S): Prasad, Arun
PATENT ASSIGNEE(S): Jeneric/Pentron Incorporated, USA

SOURCE: PCT Int. Appl., 12 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001034097	A2	20010517	WO 2000-US42044	200011 10
WO 2001034097	A3	20011213		

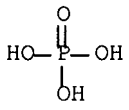
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR

PRIORITY APPLN. INFO.: US 1999-165171P P 199911 12

AB A dental restoration comprises a ceramic core material having a thin metallic **layer** disposed on the interior surface of the ceramic core to provide integrity to the ceramic core, eliminate bonding between the ceramic core and the patient's tooth or teeth, and provide an impervious **layer** on the ceramic interior to reduce infiltration of fluids into the ceramic and reduce cracking of the ceramic restoration. The metallic **layer** may comprise a metal, alloy or metal-matrix ceramic material. A strong, crack-resistant ceramic restoration is provided having highly aesthetic properties (no data).

IT **10377-52-3, Lithium** phosphate
RL: DEV (Device component use); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(**metalization** of ceramic restorations)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



IC ICM A61K006-00
CC 63-7 (Pharmaceuticals)

IT 1302-67-6, Spinel 1302-93-8, Mullite 1314-23-4, Zirconia, biological studies 1344-28-1, Alumina, biological studies 7440-05-3, Palladium, biological studies 7440-06-4, Platinum, biological studies 7440-16-6, Rhodium, biological studies 7440-22-4, Silver, biological studies 7440-31-5, Tin, biological studies 7440-32-6, Titanium, biological studies 7440-36-0, Antimony, biological studies 7440-55-3, Gallium, biological studies 7440-57-5, Gold, biological studies 7440-74-6, Indium, biological studies 10102-24-6, **Lithium** silicate
10377-52-3, Lithium phosphate 13463-67-7, Titania, biological studies
RL: DEV (Device component use); THU (Therapeutic use); BIOL

(Biological study); USES (Uses)
(**metalization** of ceramic restorations)

L19 ANSWER 18 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:725905 HCAPLUS Full-text
DOCUMENT NUMBER: 133:269464
TITLE: Battery with an in-situ activation plated lithium anode
INVENTOR(S): Neudecker, Bernd J.; Dudney, Nancy J.; Bates, John B.
PATENT ASSIGNEE(S): Lockheed Martin Energy Research Corp., USA
SOURCE: PCT Int. Appl., 28 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000060689	A1	20001012	WO 2000-US6997	20000317
US 6168884	B1	20010102	US 1999-285326	19990402

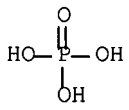
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: US 1999-285326 A1 19990402

AB A thin-film rechargeable battery includes: a cathode film including a **lithium** transition **metal** oxide, an electrolyte film coupled to the cathode film, the electrolyte film being substantially nonreactive with oxidizing materials and with **metallic lithium**, an anode current collector coupled to the electrolyte film; and an overlying **layer** coupled to the anode current collector. The thin-film rechargeable battery is activated during an initial charge by electrochem. plating of a **metallic lithium** anode between the anode current collector and the electrolyte film. The plating of the anode during charging and the stripping of the anode **layer** during discharging are essentially reversible. Therefore, almost no diminishment of discharge capacity occurs, even after many discharge and charge cycles. Other advantages include no need for special packaging for shipping and handling. The battery eliminates the main drawbacks of the thin-film Li-ion battery (high capacity loss during the initial charge) and of the thin-film lithium battery (high air-sensitivity at all times, temperature limited to .apprx.100°, expensive preparation of the lithium anode). The battery survives processing conditions that exceed those of a solder reflow process without any signs of degradation

IT **10377-52-3**, Lithiumphosphate li3po4
RL: DEV (Device component use); USES (Uses)
(battery with in-situ activation plated lithium anode)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

IT **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(overlying **layer** coupled to anode grid; battery with in-situ activation plated lithium anode)
RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M010-36
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(overlying **layer** coupled to anode grid; battery with in-situ activation plated lithium anode)
IT 7439-93-2, Lithium, uses **10377-52-3**, Lithiumphosphate li3po4 12031-65-1, Lithium nickel oxide linio2 12057-17-9, Lithium manganese oxide limn2o4 12190-79-3, Cobalt lithium oxide colio2
RL: DEV (Device component use); USES (Uses)
(battery with in-situ activation plated lithium anode)
IT 1304-28-5, Barium oxide bao, uses 1304-56-9, Beryllium oxide beo, uses 1305-78-8, Calcium oxide cao, uses 1309-48-4, Magnesia, uses 1312-81-8, Lanthana 1314-11-0, Strontium oxide sro, uses 1314-20-1, Thoria, uses 1314-36-9, Yttria, uses 7440-25-7, Tantalum, uses 7440-33-7, Tungsten, uses 7440-41-7, Beryllium, uses 7440-67-7, Zirconium, uses 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7631-86-9, Silica, uses 7789-24-4, Lithium fluoride, uses 9002-84-0, Ptfe 9002-88-4 10043-11-5, Boron nitride bn, uses 10377-51-2, Lithium iodide 12033-76-0, Silicon nitride oxide si2n2o 12033-89-5, Silicon nitride, uses 12060-08-1, Scandium oxide sc2o3 12169-03-8, Lithium yttrium oxide liyo2 12209-15-3, Lithium scandium oxide lisco2 12232-41-6, Beryllium lithium oxide be2li2o3 12355-58-7, Aluminum lithium oxide alli5o4 12384-10-0, Lithium zirconium oxide li8zro6 13453-84-4, Lithium silicate li4sio4 24304-00-5, Aluminum nitride 25722-33-2, Parylene 39449-52-0, Lithium silicate li8sio6 56320-64-0, Beryllium lithium oxide (BeLi4O3) 57349-02-7, Cerium lithium oxide celio2 **184905-46-2**, Lithium nitrogen phosphorus oxide

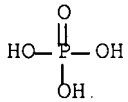
RL: TEM (Technical or engineered material use); USES (Uses)
(overlying **layer** coupled to anode grid; battery with in-situ activation plated lithium anode)
REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 19 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:454456 HCAPLUS Full-text
DOCUMENT NUMBER: 133:61361
TITLE: All-solid lithium ion batteries and their manufacture
INVENTOR(S): Tomoyose, Ichiji; Roppongi, Yasunobu
PATENT ASSIGNEE(S): Trionix K. K., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000188113	A	20000704	JP 1998-366551	19981224
PRIORITY APPLN. INFO.:			JP 1998-366551	19981224

AB Batteries with the solid electrolyte **layer**, manufactured from vapor deposition sources comprising of powders of **Li** compds. and **metal** oxides and/or sulfides, are claimed. The solid electrolyte **layer** is manufactured using vapor deposition sources made by heat pressing of (A) mixts. of powders of **Li** compds. and **metal** oxides and/or sulfides or (B) powder ceramics containing **Li** compds. and **metal** oxides and/or sulfides. Very thin batteries with high ion conductivity are manufactured

IT **10377-52-3**, Lithium phosphate
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(manufacture of all-solid lithium ion batteries by formation of electrolyte **layer** by vapor deposition)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



3 Li

IC ICM H01M006-18
ICS C04B035-00; C23C014-34
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Battery electrolytes

(films; manufacture of all-solid lithium ion batteries by formation of electrolyte **layer** by vapor deposition)

IT Vapor deposition process
(manufacture of all-solid lithium ion batteries by formation of electrolyte **layer** by vapor deposition)

IT 1344-28-1, Alumina, processes **10377-52-3**, Lithium phosphate 13463-67-7, Titania, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(manufacture of all-solid lithium ion batteries by formation of electrolyte **layer** by vapor deposition)

L19 ANSWER 20 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:113026 HCAPLUS Full-text
DOCUMENT NUMBER: 132:125362
TITLE: Protective coatings for battery anodes
INVENTOR(S): Visco, Steven J.; Chu, May-Ying
PATENT ASSIGNEE(S): Polyplus Battery Company, Inc., USA
SOURCE: U.S., 18 pp., Cont.-in-part of U.S. 5,789,108.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 15
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6025094	A	20000215	US 1998-86665	19980529
US 5523179	A	19960604	US 1994-344384	19941123
US 5582623	A	19961210	US 1995-479687	19950607
US 5686201	A	19971111	US 1996-686609	19960726
US 5789108	A	19980804	US 1997-814927	19970311
US 2001041294	A1	20011115	US 2001-901970	20010709
US 6723140	B2	20040420		
PRIORITY APPLN. INFO.:			US 1994-344384 A2	19941123
			US 1995-479687 A2	19950607
			US 1996-686609 A2	19960726
			US 1997-814927 A2	19970311

11

US 1998-86665 A 199805 29

US 1998-139601 A 199808 25

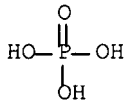
US 1998-139603 A1 199808 25

AB Disclosed is an alkali metal neg. electrode having a protective **layer**. Specifically, the disclosed neg. electrode includes a glassy or amorphous surface protective **layer** which conducts alkali metal ions but effectively blocks the alkali metal in the electrode from direct contact with the ambient. The protective **layer** has improved smoothness and reduced internal stress in comparison to prior protective **layers** such as those formed by sputtering. In a specific embodiment, the protective **layer** is formed on the **lithium metal** electrode surface by a plasma assisted deposition technique.

IT **10377-52-3**, Lithium phosphate li3po4 **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(protective coatings for battery anodes)

RN 10377-52-3 HCAPLUS

CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



RN 184905-46-2 HCAPLUS

CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-58

INCL 429231950

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 554-13-2, Lithium carbonate 1303-86-2, Boron oxide b2o3, uses 1314-80-3, Phosphorus pentasulfide 7631-86-9, Silica, uses 10377-51-2, Lithium iodide **10377-52-3**, Lithium phosphate li3po4 12057-24-8, Lithia, uses 12627-14-4, Lithium silicate 12676-27-6 26134-62-3, Lithium nitride 37220-89-6, Lithium

aluminate **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 236388-74-2, Lithium boride sulfide 236388-75-3, Aluminum lithium sulfide 236388-76-4, Lithium phosphide sulfide
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(protective coatings for battery anodes)

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 21 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:723300 HCAPLUS Full-text
DOCUMENT NUMBER: 131:312496
TITLE: Encapsulated lithium electrodes having glass protective **layers** and method for their preparation
INVENTOR(S): Visco, Steve J.; Tsang, Floris Y.
PATENT ASSIGNEE(S): Polyplus Battery Company, Inc., USA
SOURCE: PCT Int. Appl., 33 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 15
PATENT INFORMATION:

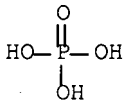
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9957770	A1	19991111	WO 1999-US6895	19990329
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 6214061	B1	20010410	US 1998-139601	19980825
CA 2330293	A1	19991111	CA 1999-2330293	19990329
AU 9933713	A	19991123	AU 1999-33713	19990329
AU 745287	B2	20020321		
EP 1093672	A1	20010425	EP 1999-915119	19990329
EP 1093672	B1	20040825		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
BR 9910109	A	20011009	BR 1999-10109	19990329
JP 2002513991	T	20020514	JP 2000-547661	

				199903 29
AT 274752	T	20040915	AT 1999-915119	
				199903 29
US 6432584	B1	20020813	US 2000-678063	
				200010 02
PRIORITY APPLN. INFO.:			US 1998-83947P	P
				199805 01
			US 1998-139601	A
				199808 25
			WO 1999-US6895	W
				199903 29

AB A method for fabricating an active **metal** electrode involves depositing **lithium** or other active **metal** electrode on a protective **layer**. The protective **layer** is a glassy or amorphous material that conducts ions of the active metal. It may be deposited on a releasable web carrier or other substrate such as polymer electrolyte **layer**. Lithium is then deposited on the protective **layer**. Finally, a current collector is attached to the lithium.

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: DEV (Device component use); USES (Uses)
(protective **layer** containing; encapsulated lithium electrodes having glass protective **layers** and method for their preparation)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-02
ICS H01M004-04; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 38
IT Secondary batteries
(Li-S; encapsulated lithium electrodes having glass protective **layers** and method for their preparation)
IT Battery anodes
Encapsulation
Polymer electrolytes
(encapsulated lithium electrodes having glass protective **layers** and method for their preparation)
IT Polyethers, uses
Polymers, uses
Polyphosphazenes
Polythioethers
RL: DEV (Device component use); USES (Uses)
(gel electrolyte containing; encapsulated lithium electrodes having glass protective **layers** and method for their preparation)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(gel or solid electrolyte containing; encapsulated lithium electrodes having glass protective **layers** and method for their preparation)
IT Battery electrolytes
(gel; encapsulated lithium electrodes having glass protective **layers** and method for their preparation)
IT Imines
RL: DEV (Device component use); USES (Uses)
(polyimines, gel electrolyte containing; encapsulated lithium electrodes having glass protective **layers** and method for their preparation)
IT 7440-02-0, Nickel, uses 12597-68-1, Stainless steel, uses
RL: DEV (Device component use); USES (Uses)
(current collector; encapsulated lithium electrodes having glass protective **layers** and method for their preparation)
IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(encapsulated lithium electrodes having glass protective **layers** and method for their preparation)
IT **10377-52-3**, Lithium phosphate 12627-14-4, Lithium silicate 12676-27-6 37220-89-6, Lithium aluminate **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 236388-74-2, Lithium boride sulfide 236388-75-3, Aluminum Lithium sulfide 236388-76-4, Lithium phosphide sulfide
RL: DEV (Device component use); USES (Uses)
(protective **layer** containing; encapsulated lithium electrodes having glass protective **layers** and method for their preparation)
IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7440-31-5, Tin, uses 7440-50-8, Copper, uses 7440-66-6, Zinc, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(releasable web carrier; encapsulated lithium electrodes having glass protective **layers** and method for their preparation)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 22 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:549496 HCAPLUS Full-text
DOCUMENT NUMBER: 131:146969
TITLE: Plating metal anodes under protective coatings for use in batteries

INVENTOR(S): Chu, May-Ming; Visco, Steven J.; De Jonghe, Lutgard C.
PATENT ASSIGNEE(S): Polyplus Battery Company, Inc., USA
SOURCE: PCT Int. Appl., 40 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 15
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9943034	A1	19990826	WO 1999-US3335	19990217
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW				
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 6402795	B1	20020611	US 1998-139603	19980825
CA 2322131	A1	19990826	CA 1999-2322131	19990217
AU 9932959	A	19990906	AU 1999-32959	19990217
AU 743685	B2	20020131		
BR 9908010	A	20001024	BR 1999-8010	19990217
EP 1057222	A1	20001206	EP 1999-934368	19990217
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, LV, FI				
JP 2002504741	T	20020212	JP 2000-532875	19990217

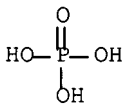
PRIORITY APPLN. INFO.:		
US 1998-75017P	P	19980218
US 1998-139603	A	19980825
WO 1999-US3335	W	19990217

AB A method for forming lithium electrodes having protective **layers** involves plating lithium between a lithium ion conductive protective **layer** and a current collector of an electrode precursor. The electrode precursor is formed by depositing the

protective **layer** on a very smooth surface of a current collector. The protective **layer** is a glass such as lithium phosphorus oxynitride and the current collector is a conductive sheet such as a copper sheet. During plating, lithium ions move through the protective **layer** and a **lithium metal layer** plates onto the surface of the current collector. The resulting structure is a protected lithium electrode. To facilitate uniform lithium plating, the electrode precursor may include a wetting **layer** which coats the current collector.

IT **7439-93-2, Lithium**, uses
RL: DEV (Device component use); FMU (Formation, unclassified); FORM (Formation, nonpreparative); USES (Uses)
(plating **metal** anodes under protective coatings for use in batteries)
RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

IT **10377-52-3**, Lithium phosphate **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(protective **layer**; plating metal anodes under protective coatings for use in batteries)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M004-04
ICS H01M004-12; H01M010-36; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Primary batteries
Secondary batteries
(**lithium**; plating **metal** anodes under protective coatings for use in batteries)
IT 7429-90-5, Aluminum, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-31-5, Tin, uses 7440-44-0, Carbon, uses 11126-12-8, Iron

sulfide 12673-92-6, Titanium sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(anode precursor, wetting **layer** material; plating metal anodes under protective coatings for use in batteries)

IT **7439-93-2, Lithium**, uses
RL: DEV (Device component use); FMU (Formation, unclassified); FORM (Formation, nonpreparative); USES (Uses)
(plating **metal** anodes under protective coatings for use in batteries)

IT 74432-42-1, **Lithium** polysulfide 236388-74-2, **Lithium** boride sulfide 236388-76-4, **Lithium** phosphide sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(plating **metal** anodes under protective coatings for use in batteries)

IT **10377-52-3**, Lithium phosphate 12627-14-4, Lithium silicate 12676-27-6 37220-89-6, Lithium aluminate **184905-46-2**, Lithium nitrogen phosphorus oxide 236388-73-1, Lithium silicide sulfide 236388-75-3, Aluminum lithium sulfide
RL: TEM (Technical or engineered material use); USES (Uses)
(protective **layer**; plating metal anodes under protective coatings for use in batteries)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

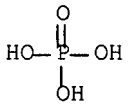
L19 ANSWER 23 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:147847 HCAPLUS Full-text
DOCUMENT NUMBER: 130:170658
TITLE: Electrode-electrolyte unit and its production and use in thin-film battery and electrochromic device
INVENTOR(S): Weppner, Werner; Birke, Peter
PATENT ASSIGNEE(S): Germany
SOURCE: Ger. Offen., 14 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19735803	A1	19990225	DE 1997-19735803	19970818
DE 19735803	B4	20061019		
PRIORITY APPLN. INFO.:			DE 1997-19735803	19970818

AB The unit includes an electrode of a conducting ions-forming element, such as **Li**, and a transition **metal**-containing oxide, sulfide, nitride, fluoride, chloride, and/or carbide; or an alloy of a conducting ion-forming element; and an electrolyte of a conducting ions-forming element, such as Li, and a main group element- and/or transition metal-containing oxide, sulfide, nitride, fluoride, and/or chloride. The fabrication efficiency and the elec. properties of the unit can be improved by providing a conducting ions-conducting intermediate **layer** between the electrode and the electrolyte and/or by simultaneous insertion of the

conducting ions-forming element into the cathode material and by oxidizing the electrolyte by closing and outer plasma-including current circuit.

IT **10377-52-3P**, Trilithium phosphate
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(in electrode-electrolyte unit for use in thin-film battery and electrochromic device)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



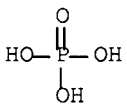
IT **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(in electrode-electrolyte unit for use in thin-film battery and electrochromic device)
RN 184905-46-2 HCAPLUS
CN Lithium nitrogen phosphorus oxide (CA INDEX NAME)

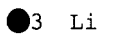
Component	Ratio	Component Registry Number
N	x	17778-88-0
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

IC ICM H01M010-02
ICS C23C016-50; G09F009-35; G02F001-153
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 74
IT 1314-35-8DP, Tungsten oxide (WO3), lithiated, uses
10377-52-3P, Trilithium phosphate 12031-66-2P, Lithium tantalum oxide (LiTaO3) 52627-24-4P, Cobalt lithium oxide
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(in electrode-electrolyte unit for use in thin-film battery and electrochromic device)
IT 17372-42-8 **184905-46-2**, Lithium nitrogen phosphorus oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(in electrode-electrolyte unit for use in thin-film battery and electrochromic device)

L19 ANSWER 24 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1998:463093 HCAPLUS Full-text
DOCUMENT NUMBER: 129:183350
TITLE: Crystal structure and cation transport properties of the **layered** monodiphosphates: Li9M3(P2O7)3(PO4)2 (M = Al, Ga, Cr, Fe)
AUTHOR(S): Poisson, S.; D'yvoire, F.; Guyen-Huy-Dung, N.;

Bretey, E.; Berthet, P.
CORPORATE SOURCE: Laboratoire de Chimie des Solides, URA-CNRS 446, Universite Paris-Sud, Orsay, 91405, Fr.
SOURCE: Journal of Solid State Chemistry (1998), 138(1), 32-40
CODEN: JSSCBI; ISSN: 0022-4596
PUBLISHER: Academic Press
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Isotypic monodiphosphates Li9M3(P2O7)3(PO4)2 (M = Al, Ga, Cr, Fe) were synthesized by flux methods. The crystal structure of the Al and Fe members is described here. They crystallize in the trigonal space group P.hivin.3c1 with a 9.553(1), c 13.492(2) Å (M = Al), a 9.726(1), c 13.615(2) Å (M = Fe) and Z = 2. The structure consists of ∞2[(MP2O7)3(PO4)2]9- corrugated **layers**, parallel to (001), separated by Li ions. The **layers** are built up of MO6 octahedra sharing corners with PO4 tetrahedra and P2O7 groups. Three nonequivalent Li ions are present according to the structural formula Li(1)1Li(2)2Li(3)6[MP(2)2O7]3[P(1)O4]2. The crystals exhibit a Li ion conduction mainly parallel to (001) but with rather low conductivity values: σ#(001) = 1.3 + 10-4 and 3.0 + 10-6 Ω-1 cm-1 at 300° for M = Fe and M = Al, resp. In the presence of acidic aqueous solns., Li9Fe3(P2O7)3(PO4)2 undergoes an ion-exchange reaction between Li+ and H+ with the introduction of H2O mols., which causes a 1-dimensional expansion of the crystals perpendicular to the **layers**. (c) 1998 Academic Press.
IT **10377-52-3**, Trilithium phosphate
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of **lithium metal** phosphate pyrophosphates)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)





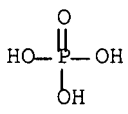
CC 78-6 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 75, 76
ST lithium double phosphate diphosphate prepn; crystal structure lithium double phosphate diphosphate; structure lithium aluminum iron phosphate diphosphate; aluminum lithium phosphate diphosphate prepn structure; iron lithium phosphate diphosphate prepn structure; elec cond **lithium metal** phosphate diphosphate; gallium lithium phosphate diphosphate prepn; chromium lithium phosphate diphosphate prepn
IT 1308-38-9, Chromium sesquioxide, reactions 1309-37-1, Ferric oxide, reactions 1344-28-1, Alumina, reactions 7722-76-1, Ammonium dihydrogen phosphate **10377-52-3**, Trilithium phosphate 12024-21-4, Gallium sesquioxide
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of **lithium metal** phosphate pyrophosphates)
REFERENCE COUNT: 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 25 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1996:472923 HCAPLUS Full-text
DOCUMENT NUMBER: 125:119497
TITLE: Secondary nonaqueous-electrolyte lithium batteries with improved cathodes
INVENTOR(S): Fujiwara, Masafumi; Yamada, Shuji; Oosaki, Takahisa
PATENT ASSIGNEE(S): Tokyo Shibaura Electric Co, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 08138670	A	19960531	JP 1994-277513	199411 11
JP 3195175	B2	20010806		
PRIORITY APPLN. INFO.:			JP 1994-277513	199411 11

AB The batteries use cathodes from LiNiO2 containing alkali **metals** other than **Li**, alkaline earth **metals**, transition metals other than Ni, group III, IV, V, and/or chalcogens at least on the surface, and having coatings containing higher amts. of the metals than the bulk, and preferably sp. surface area 0.5-2 m2/g. The metals may have a specified Pauling electronegativity.

IT **10377-52-3**, Lithium phosphate
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(in prepn of cathodes from lithium nickel oxide having high-metal surface **layer**)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

IC ICM H01M004-58
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Alkali **metals**, uses
Alkaline earth **metals**
Group IIIB elements
Group IVB elements
Group VB elements
Group VIA elements
RL: MOA (Modifier or additive use); USES (Uses)

(cathodes from **lithium** nickel oxide having high-metal surface **layer**)

IT Cathodes
(battery, from lithium nickel oxide having high-metal surface **layer**)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-96-5, Manganese, uses 7440-21-3, Silicon, uses 7440-42-8, Boron, uses 7440-48-4, Cobalt, uses 7440-55-3, Gallium, uses 7440-66-6, Zinc, uses 7704-34-9, Sulfur, uses 7723-14-0, Phosphorus, uses
RL: MOA (Modifier or additive use); USES (Uses)
(cathodes from lithium nickel oxide having high-metal surface **layer**)

IT 12031-65-1, Lithium nickel oxide (LiNiO2)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(cathodes having high-metal surface **layer**)

IT 1309-33-7, Iron hydroxide [Fe(OH)3] 1310-65-2, Lithium hydroxide 10377-48-7, Lithium sulfate **10377-52-3**, Lithium phosphate 10377-66-9, Manganese nitrate 12007-60-2, Lithium borate (Li2B4O7) 13494-91-2, Gallium sulfate[Ga2(SO4)3] 20427-58-1, Zinc hydroxide 21041-93-0, Cobalt hydroxide [Co(OH)2] 21645-51-2, Aluminum hydroxide, processes 82867-86-5
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(in prepn of cathodes from lithium nickel oxide having high-metal surface **layer**)

L19 ANSWER 26 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1987:217007 HCAPLUS Full-text
DOCUMENT NUMBER: 106:217007
TITLE: Solid-state batteries
INVENTOR(S): Mizuno, Yasuo; Kondo, Shigeo
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 3 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

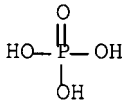
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 61263068	A	19861121	JP 1985-105110	19850517
PRIORITY APPLN. INFO.:			JP 1985-105110	19850517

AB The batteries use Li ion-conducting solid electrolyte and **Li** -intercalated transition **metal** oxide anodes having a solid electrolyte **layer** on the side opposite to the battery electrolyte. A substrate was successively deposited with a Ni-20% Cr cathode collector, a 1-μ WO3 cathode, a LiTaO3 electrolyte **layer**, a 1-μ WO3 **layer**, a Ni anode collector, and a LiTaO3 **layer**. The composite was immersed in 1M LiClO4 in propylene carbonate, and the WO3 **layer** was short-circuited with a Li piece for 5 h to intercalate the **layer** with Li to form an anode. After drying, the battery was coated with epoxy resin. The battery showed an open-circuit voltage of 2.5 V, and the capacity decreased 10% after 100 charging-discharging cycles at 5 μA/cm2. Intercalation of the anode by this method is safer than vacuum deposition.

IT **7439-93-2**, uses and miscellaneous
RL: USES (Uses)
(anodes from transition **metal** oxide intercalated with, for solid-state batteries)
RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

Li

IT **10377-52-3**
RL: USES (Uses)
(electrolytes, lithium anodes with backside coatings of, for solid state batteries)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, lithium salt (1:3) (CA INDEX NAME)



●3 Li

IC ICM H01M010-36
ICS H01M006-18
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Anodes
(battery, **lithium**-intercalated transition **metal** oxide, manufacture of)
IT **7439-93-2**, uses and miscellaneous
RL: USES (Uses)
(anodes from transition **metal** oxide intercalated with, for solid-state batteries)
IT **10377-52-3** 12031-66-2 13453-84-4 15138-76-8
RL: USES (Uses)
(electrolytes, lithium anodes with backside coatings of, for solid state batteries)

L19 ANSWER 27 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1987:199239 HCAPLUS Full-text
DOCUMENT NUMBER: 106:199239
TITLE: Secondary nonaqueous batteries
INVENTOR(S): Mizuno, Yasuo; Kondo, Shigeo
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE